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*Illustrated.

A number of Oklahoma grain dealers are pressing the railroads to pay for grain damaged by the recent storm at Galveston.

An Early Bird That Started Too Soon

\$1,400 for damage to a shipment of grain by salt water, and was based, not on the invoice value, but on the Galveston price,

for the entire contents of the car. The grain was shipped about August 5, and should have reached Galveston about August 9, but as a matter of fact, owing to an error in the billing, the car was held up at Ft. Worth, over 300 miles away, and did not leave that point en route to Galveston until several days after the storm was over. After investigation the railroad advised the claimant that the car was nowhere near Galveston during the storm, and the latter explained that he had merely assumed that his freight had been damaged and had placed his claim promptly in order to be sure to get it in within the time limit. The incident clearly illustrates the entire willingness of some of the shippers of this country to sell their product to the railway carriers at a price including their regular profit!

The San Francisco Examiner contends in a recent editorial that the 82 railroads which the *Railway Age Gazette* has shown were

Railroad Capitalization and Bankruptcy

on October 1 in the hands of receivers deserve no pity. It computes their average capitalization per mile at \$54,000. It adds: "Now, the average railroad capitalized at \$54,000 a mile is on the way to the receiver when the first rail is laid and the first spike is driven. That means at least \$20,000 a mile of dishonest capitalization—of wind and water—and a railroad cannot run on either of those elements. It is just such dishonestly capitalized corporations that induce and require regulation. In order to keep going they have to charge more than the traffic will bear." The answers to such foolish statements as these are so numerous it is difficult to choose which to use. Their implication is that the "average railroad" should not be capitalized for over \$34,000 a mile. There is not a system of standard gage railways on earth which is not capitalized for much more than this. The Examiner is an ardent advocate of government ownership. Let us test the intelligence and fairness of its statement by the average costs of construction per mile reported by typical systems of railways owned entirely, or practically entirely, by governments. The following are the average costs of construction per mile reported for the state railways of certain countries: New Zealand, \$53,789; Denmark, \$62,763; Victoria, \$63,519; New South Wales, \$75,200; Japan, \$89,102; Italy, \$158,185. In Germany, where most of the railways are owned by the government, the average cost of construction is reported as \$116,365; and in Belgium, to which the same statement applies, it is reported as \$216,143. The average cost of construction of the National Transcontinental Railway, which has recently been built by the government of Canada, was about \$99,000, without equipment or adequate terminals. The government of the United States, in connection with the building of the Panama Canal, reconstructed the Panama Railroad. Colonel Goethals testified that up to November 1, 1911, this reconstruction work had cost \$167,000 a mile, and that it would reach \$226,190 a mile. From these statistics of state railways scattered all over the world the reader will be obliged to draw one of two conclusions. He will probably conclude that since it costs the average government a great deal more than \$54,000 a mile to build an "average railroad" a policy of regulation which contributes toward the bankruptcy of private railways having only this average capitalization is of very doubtful fairness or wisdom. On the other hand, if he agrees with the San Francisco Examiner that a capitalization of \$54,000 a mile "means at least \$20,000 a mile of dishonest capitalization," and that a railroad with such a capitalization must "charge more than the traffic will bear in order to keep going," what must he conclude as to the intelligence or consistency of a paper which denounces private railways with a capitalization of only \$54,000 and defends a policy of regulation, and at the same time advocates a policy of government ownership which results in capitalizations varying from \$54,000 to over \$200,000?

PREPAREDNESS FOR PROSPERITY

AT a time when the press is filled with pleas for adequate measures for national defense, a more pressing and immediate need is being overlooked, namely preparedness for prosperity. In passing from a cycle of depression to a period of renewed enterprise and business activity, the railroads are facing a critical time in their history. Already roads are experiencing difficulty in handling increased freight traffic; the surplus of cars has been reduced to a negligible figure and car shortages are rapidly assuming alarming proportions.

We have already pointed out that the car shortage is partly due to the congestion of freight at the ports caused by a shortage of vessel capacity, but a review of the orders for cars during the past two years is illuminating. In 1914, the railways contracted for 80,000 cars, or approximately one-half as many as in 1913, one-third the number ordered in 1912 and decidedly less than the total ordered in any previous year since 1901, except 1908. Up to November 19 of the present year, our reports show that 85,000 freight cars have been ordered for domestic service, which is not a marked improvement over the record of 1914. When one considers that approximately 150,000 cars are required annually to replace wornout equipment alone, it is evident that the railroads are not fully prepared to carry the traffic of a normal year.

Unusual conditions in the steel industry emphasize the necessity for ordering more rolling stock, and at once. A prominent car builder estimates that less than two-thirds of the steel required for car contracts now placed will be delivered before July 1, 1916, delaying the completion of cars until late in the summer, and states, further, that little or no equipment ordered after January 1 can be completed before the close of the year. The present demand for steel is unprecedented; plants are working to capacity and contracts now under way will keep them busy for many months to come.

Conditions in the steel market have been changing so rapidly of late that it has been difficult for railroad men to keep fully informed concerning them. Up to a short time ago the railroads and other purchasers were out of the market to such an extent that their mills were running on a greatly decreased production and prompt deliveries could be secured for any order given. Almost overnight conditions changed. The unfilled tonnage of the United States Steel Corporation and other steel companies has risen rapidly and orders are still being taken far in excess of the current output. Because of this the Steel Corporation withdrew quotations in the foreign markets a few days ago. This condition has developed at a time when the production has increased rapidly. Less than a month ago the new plant of the Minnesota Steel Company, a subsidiary of the Steel Corporation at Duluth, was opened. The Cambria Steel Company made a new high record for output on October and other mills have established similar records.

The immediate effect of this condition on the railroads has been to make it practically impossible for them to secure early deliveries. This has led to the placing of orders for rails and similar products considerably earlier than in previous years, until at the present time, most of the large orders for rails for next year have been placed and those still unplaced are being accepted only for late delivery. As an instance, the Rock Island was unable to secure early delivery on its order of 40,000 tons of rails placed two weeks ago.

The situation in the steel market has affected the railways in another way. Many of their materials are purchased from supply concerns, which in turn buy their steel from the mills. After long periods of slack business, these concerns are sharing in the revival of purchases, but are being confronted with the same conditions in the steel market as the railways, and are now finding difficulty in securing the steel to fill their orders. This is true of such specialties as tie plates and other track fastenings, as well as of car and bridge materials. Some supply concerns are now practically out of the market, not because they are running to full capacity, but because they are unable to secure the neces-

sary steel. This condition makes it necessary for the railways to follow up their heavy rail and equipment purchases with those for the specialties which they will require to secure even delayed 1916 delivery.

The prices for cars have risen from 15 to 20 per cent in the past six months, and there is no hope of an early decline. But with the prospect of increasingly slow deliveries and serious shortages of cars, price no longer remains a prime consideration. The railroads are not only struggling for long deferred and deserved profits, but for public favor; after years of misguided abuse and destructive interference they have gradually gained adherents to their point of view and broken popular prejudice against them. Much of the difficulty the railroads have experienced in the way of hostile regulation can be traced to the car shortage of 1906-1907. Failure on the part of the carriers to cope with the traffic of 1916 will wipe out much that has been gained in this direction and will revive "down with the railroads" as an effective slogan for ranting muckrakers and demagogues.

The reasons why the railroads have not been adding to their equipment as rapidly as in former years should be self-evident by this time. They have not been in a financial condition to do so until it became certain that the equipment would be needed. It is easy enough to say that the railroads should have bought cars a while ago when prices were low, but if the railroads generally had been able to place orders the prices would not have been low and only a few strong roads were in a position to take advantage of the opportunity.

THE REAL L. C. L. PROBLEM

LARGELY because of the relatively small tonnage included in the L. C. L. business, this class of railway traffic has not received the attention of operating officers that it has deserved. It is primarily for this reason that there has been so little change in the methods of handling it in recent years in the average freight house. But many of the men directly engaged in this branch of railway operation are fully alive to its importance and to the opportunities for improvement. The attention which many of them are giving to the subject is indicated by the interest shown in the contest conducted by the *Railway Age Gazette* on the Handling of L. C. L. Freight which closed recently, and in the number of contributions received. The two prize-winning papers are published elsewhere in this issue and others will be published from time to time in later issues.

In common with other terminal facilities, those for the handling of L. C. L. freight are generally inadequate for the present volume of business and are unsuited in design for the most modern and economical methods of operation. But, unlike the case of classification yards, where the best means of securing improved facilities is to move further out of the city, where larger space can be obtained at more reasonable rates, L. C. L. freight houses must remain close to the industrial centers if they are to perform their functions properly. This means that expansion of the facilities is possible only at heavy expense; and, therefore, expansion is deferred longer than would otherwise be the case. As a result the problem in most freight houses is not the inauguration of methods adapted for the operation of new and modern facilities, but the utilization of the existing facilities to the best advantage.

This problem may be attacked from a number of standpoints—the installation of improved equipment, the rearrangement of methods to eliminate lost motion, increasing the capacity of the men by securing their interested co-operation, etc. A few years ago the hand truck was the universal instrument for freight house operation. Since that time the four-wheel platform truck has appeared, followed by the motor truck. Each type of equipment has its particular field and much care should be exercised in so arranging the work and instructing the men that the combined equipment shall be used to the best advantage. It is no more economical to use a motor truck for a very short haul than it is to use a hand truck for a long haul.

However much practical railway men may and do criticise time and motion studies, an elementary study of this kind will reveal many sources of lost motion in freight house operation, the removal of which will increase the efficiency of the house without adding to the burden of the laborers. Theoretically, every freight house foreman is watching for opportunities for making such improvements; practically, in the rush of his regular duties, he often fails to observe and remove cross trucking and other causes of inefficiency.

A great opportunity for improvement and one quite generally realized is in the best utilization of the labor employed. In the average freight house operating on a flat rate wage basis there is a certain "professional" pace, generally set by the slowest trucker, which is followed by all truckers and which therefore regulates the speed of operation of the house. Any means to increase this speed will decrease the time required for trucking and increase the tonnage of freight handled per man. The bonus system is the common incentive for this purpose. By its use the men share in any increased production on their part, and it is interesting to note that nearly all the contributions to this contest have favored its use.

As we said before, the problem in freight house operation is not to determine what would be most advisable under ideal conditions, but rather what can be done under the conditions which actually exist. A dollar saved in the operation of a freight house is just as large and just as valuable to the railroad as one saved by any other operating economy.

LOSS AND DAMAGE PAYMENTS

AFTER having conducted a "safety first" campaign for the prevention of accidents to persons for several years with remarkable success, the railroads have recently achieved some very good results by applying "safety first" principles to the handling of freight. The Committee on Packing, Marking and Handling of Freight, in its recent report to the American Railway Association, submitted statistics showing that 99 roads had saved \$3,500,000 by the reduction of their payments for loss and damage to freight during the first six months of 1915 as compared with a similar period in 1914. This reduction is about 22 per cent and as the freight revenues for this period indicate a much smaller decrease, the statistics mean not only an absolute saving, but an improvement in relation to the volume of the traffic. "It would appear from these figures," the committee says, "that the railroads have checked the tide in payments for loss and damage, which has been rising, and rising rapidly, since the fiscal year 1909."

This represents only one of the ways in which the railroads have been increasing their efficiency, but that it is an exceedingly important one is indicated by the fact that the freight loss and damage payments of the railways of the United States and Canada for the fiscal year 1914 amounted to \$36,000,000. This is one-tenth of Mr. Brandeis' million dollars a day, but a reduction of 22 per cent in this account, if continued for a year, would probably result in a greater actual saving than could be accomplished by the adoption of most of his suggestions.

The dimensions of the problem are shown in the following table giving the amounts paid on account of loss of, and damage to, freight by the railways of the United States for the last 10 years for which the figures are available, in comparison with the freight revenues for each year:

	Loss and damage payments	Freight revenue	Percentage of freight revenues
1905.....	\$19,782,692	\$1,450,772,838	1.35
1906.....	21,086,219	1,640,386,655	1.28
1907.....	25,796,083	1,823,651,998	1.41
1908.....	27,368,664	1,655,419,108	1.65
1909.....	24,754,508	1,677,614,678	1.48
1910.....	21,756,671	1,925,553,036	1.13
1911.....	24,589,215	1,925,950,887	1.27
1912.....	25,031,181	1,968,598,630	1.27
1913.....	30,885,454	2,198,930,565	1.40
1914.....	33,279,057	2,114,698,000	1.57

It will be noted that the loss and damage payments bear a very close relation to the volume of traffic as indicated by the

earnings, and that they increased in the years 1906, 1907 and 1908, not only absolutely, but in proportion to the freight revenues. Probably this was because of the increases in traffic in the preceding years, since, of course, claims are paid after the occurrence of the loss or damage. This explains the increase from 1907 to 1908 in spite of the decrease in earnings, and the decrease from 1908 to 1909 in spite of the increase in earnings. From 1909 until 1914 there was a steady gain in freight business and we would therefore naturally expect to find that the loss and damage payments increased from 1910 on. The percentages indicate, however, that the increases in loss and damage were usually more pronounced than the increases in earnings, and that the reductions have been more marked than the corresponding decreases in the volume of business. This would seem to mean that much of the loss and damage is caused by the haste that naturally accompanies the handling of a rush of business.

Some of the principal causes usually ascribed for the rapid increase in loss and damage are the greater shocks to cars and contests due to the use of larger cars and longer trains, the increasing use of hump yards, carelessness in marking, packing and loading, and the use of flimsy packing containers by shippers.

The very gratifying improvement shown recently has been achieved by unremitting effort both on the part of many individual railroads and on the part of many railroad associations in which the National Industrial Traffic League, representing the shippers, has co-operated. Especial credit is due to the Committee on Packing, Marking and Handling of Freight, which is a sub-committee of the Committee on Relations Between Railroads of the American Railway Association. The committee calls attention to the fact that these savings "took place at the period when the railroads had secured very nearly uniform instructions for packing and marking, when an improved inspection of shipments had been generally inaugurated through the individual railroads and inspection bureaus, when more railroads than ever before had organized departments to supervise loss and damage, and when general interest in this important subject had been spread more widely than ever before." It is also the belief of members of the committee that the shippers are assisting by giving more care to the preparation of goods for shipment, and the committee expresses the opinion that the economies will be continued so that next spring a further reduction will be shown.

The *Railway Age Gazette* has described at length the loss and damage campaigns which have been waged for several years on the Atchison, Topeka & Santa Fe, and the St. Louis & San Francisco, and some very successful results have recently been shown also by many other roads, either with or without a special organization for the purpose of educating their employees in proper methods and habits of carefulness and shippers in proper packing. The Santa Fe has reduced its loss and damage payments from 1.92 per cent of gross freight receipts in 1909 to .96 per cent in 1915. The Frisco, in the fiscal year 1915, reduced its loss payments on this account by 42.4 per cent as compared with the year before, while the gross freight revenue decreased only 1.7 per cent. In 1914 the claim payments were 1.68 per cent of the freight revenue and in 1915 only .98 per cent. The Illinois Central reduced its payments for loss and damage to freight in the fiscal year 1915 by 27.48 per cent, while the freight earnings decreased 6 per cent, and the Chicago & North Western in the same year reduced its loss and damage payments by 20 per cent, whereas the freight revenue decreased only 3.8 per cent.

Payments for loss and damage represent an economic waste that adds to the cost of transportation without benefit to anyone. Most shippers would greatly prefer to sell their goods to their customers than to a railroad, while the railroad that pays a claim suffers an absolute loss. The entire subject suggests a large field for improvement by active co-operation between the two parties most directly interested.

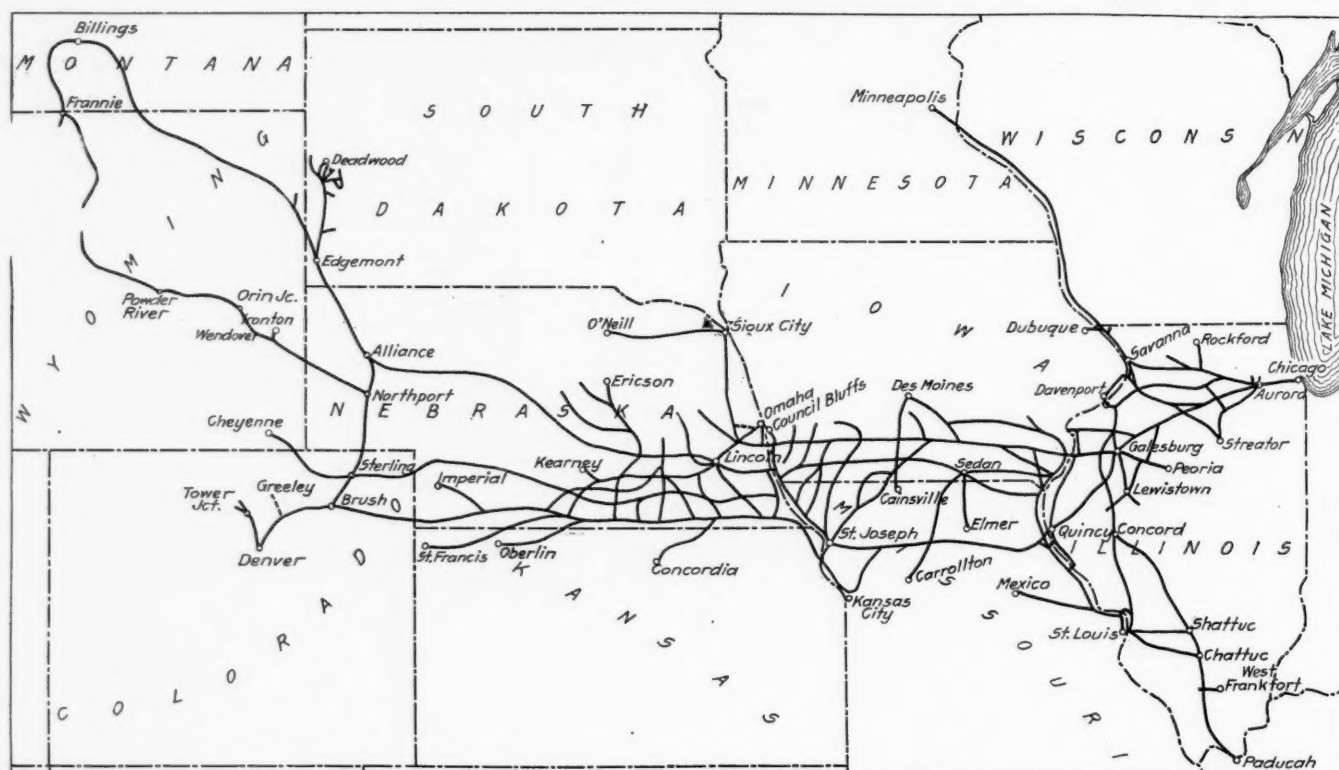
CHICAGO, BURLINGTON & QUINCY

THE commercial reviews this week are more optimistic in regard to buying by all classes of people than they have been at any time in the past few years. It is a rather interesting fact that this activity in buying by consumers, retailers and jobbers could have been, insofar as actual conditions of buying power are concerned, manifested last fall in many of the corn-raising states just as well as this year. The corn crop this year is a bumper one, but so was last year's crop. The farmers in Iowa, Kansas and Nebraska had the money to spend last fall, but they were almost as conservative, apparently, in their expenditures as were the people in the East or New England, where the European war had actually cut into the income of large classes of wage earners and business men.

This is particularly well illustrated by the experience of the Chicago, Burlington & Quincy in the fiscal year ended June 30, 1915. The Burlington runs through the very heart of the corn-

tons, and in 1914 to 223,000 tons; the tonnage of agricultural implements to 209,000 tons in 1915, comparing with 237,000 tons in 1914; of cement, brick and lime to 1,773,000 tons in 1915, comparing with 1,820,000 tons in 1914. The tonnage of bituminous coal carried in 1915 amounted to 9,413,000 tons; in 1914 to 10,069,000 tons. The present prosperity, therefore, of the corn-raising states at any rate, is founded on the savings of one very profitable year, added to the receipts which are now coming in from a second extraordinarily large crop.

The Burlington more than made up the loss of \$2,562,000 in revenue by a saving of \$2,783,000 in expenses, total operating expenses amounting to \$60,441,000 in 1915 as compared with \$63,225,000 in 1914. Of the saving in expenses \$817,000 was in maintenance of way, \$785,000 in maintenance of equipment and \$1,182,000 in transportation expenses. Probably nearly all of the saving in maintenance of way was because of cheaper track labor and a more efficient use of this labor. The showing in maintenance of equipment expenses is accounted for by the fact



The Chicago, Burlington & Quincy

raising belt and from 12 to 15 per cent of its total tonnage is made up of grain. In 1915 the road handled 4,635,000 tons of grain as against 4,309,000 tons in 1914; but the volume of grain raised and shipped in the states served by the road is only one of the factors in the prosperity of the farmers. The farmer not only had an extraordinarily large crop of corn, but he got very high prices for it. We would expect to find, therefore, that with this extraordinarily large buying power of the farmers and with the passenger business created by the expositions in California, a road like the Burlington would have shown greatly increased earnings. Just the opposite was true, however.

Total operating revenues amounted to \$91,125,000 in 1915, a decrease as compared with 1914 of \$2,562,000. Passenger revenue amounted to \$20,186,000, a decrease of \$1,558,000, and freight revenue to \$62,509,000, a decrease of \$290,000. The falling off in passenger revenue is probably directly attributable to conservatism in expenditures by eastern people who would under ordinary circumstances go to California in the winter, and also probably to conservatism on the part of the people living in the territory served by the Burlington. Further evidence of this conservatism in expenditures is shown by the fact that the tonnage of household goods carried by the Burlington in 1915 amounted to 213,000

tons, whereas the freight-train car renewals—original cost of cars scrapped less depreciation and salvage—was \$855,000 in 1914, there was a credit to this account of \$39,000 in 1915. The saving in transportation expenses was much more than proportionate to the falling off in business handled. The total passenger mileage in 1915 was 1,079,000,000, a decrease of 73,000,000, or between 6 and 7 per cent. The ton mileage handled totaled 8,527,000,000 in 1915, a decrease of 85,000,000, or less than 1 per cent. The average trainload of freight was 492 tons in 1915 as against 479 tons in 1914. The average number of empty cars per train was 12.44 as against 11.80 in 1914; of loaded cars per train 25.56 as against 25.09. The average number of tons per loaded car mile was 19.23 as against 19.08. The increase in gross trainload, therefore, was considerably larger than the increase shown in trainload of freight.

The Burlington retired 71 locomotives during the year and added 35, which changes made the average tractive power 30,808 lb. in 1915 as against 29,549 lb. in 1914. The fact that the Burlington made no charge for freight-train car renewals has been previously mentioned. The table showing equipment added and retired, however, shows that the company added 2,647 freight cars to its equipment and retired 2,289.

The total expenditure for additions and betterments during the year was \$7,509,000, of which \$942,000 was for equipment, while of the remaining \$6,566,000, \$2,357,000 was for land for transportation purposes, \$789,000 for grading, \$631,000 for rails and \$541,000 for bridges, trestles and culverts. All of the expenditure for equipment was charged to income, and of the additions and betterments, \$2,399,000 was charged to income, and of the remainder \$1,769,000 was for new lines. The total outstanding funded debt at the end of 1915 was \$181,690,000, comparing with \$182,568,600 outstanding at the beginning of the year. Cash on hand at the end of the year amounted to \$7,123,000, comparing with \$6,516,000 on hand at the beginning of the year. There were at the beginning of the year \$1,900,000 loans and bills payable, which were paid off during the year, leaving no loans and bills payable on June 30, 1915. It is interesting to note that the audited vouchers and wages unpaid at the beginning of the year was \$9,204,000, and at the end of the year \$6,047,000.

The new form of balance sheet prescribed by the Interstate Commerce Commission when applied to the Burlington's accounts brings out in a striking way the investment that has been made in that property since the Hill interests took it over. The total corporate surplus amounts to \$168,859,000. Of this, \$30,487,000 is additions to property since June 30, 1907, through income; \$14,642,000 funded debt retired through income, and \$22,109,000 sinking fund reserves. The total long-term debt of the Burlington is only \$181,690,000.

The following table shows the principal figures for operation in 1915 as compared with 1914:

	1915	1914
Average mileage operated.....	9,339	9,140
Freight revenue	\$62,509,484	\$62,799,188
Passenger revenue	20,185,564	21,743,507
Total operating revenues.....	91,125,061	93,687,141
Maintenance of way and structures.....	11,360,210	12,010,977
Maintenance of equipment.....	15,415,123	16,035,205
Traffic expenses	1,629,676	1,634,672
Transportation expenses	29,117,164	30,224,524
Miscellaneous expenses	832,154	921,586
General expenses	2,087,041	2,397,888
Total operating expenses.....	60,441,367	63,224,853
Taxes	4,081,508	4,016,658
Operating income	26,578,028	26,445,631
Gross income	27,802,098	27,739,989
Net income	19,041,919	18,807,202
Sinking funds	1,753,007	1,692,795
Dividends	8,867,128	8,867,128
Appropriation for additions and betterments.....	3,340,669	5,715,875
Surplus	5,081,115	2,531,404

CHICAGO GREAT WESTERN

IT has been six years since the Chicago Great Western was taken out of the hands of receivers. The reorganization was under the auspices of J. P. Morgan & Co. and the new company was given every opportunity to make of the property a profitable railroad. Stockholders of the old company had been assessed \$15 a share and \$10,000,000 cash was provided for immediate expenditure for betterments; fixed charges were unusually conservative—the funded debt in 1915 being only at the rate of \$26,866 per mile, and carrying only 4 per cent interest charges. A very careful plan of rehabilitation had been drawn up calling for the expenditure of between fifteen and eighteen million dollars during the first three years of the new company's management of the property. As a matter of fact, in the first three years up to June 30, 1912, a total of \$14,284,000 had been spent for additions and betterments to road and equipment.

While the fiscal year ended June 30, 1915, was one of business depression, crops were unusually good in the corn belt and in 1914 about 27 per cent of the total tonnage of freight carried by the Chicago Great Western was grain.

Total operating revenues of the Chicago Great Western, however, in 1915 amounted to \$13,921,000, or \$429,000 less than in 1914. Operating expenses amounted to \$10,447,000, a decrease as compared with the previous year of \$477,000. After the payment of rentals and fixed charges the company had \$868,000 net income, comparing with \$896,000 in 1914. There is a total of \$89,150,000 outstanding stock, so that this net income would have been less than one per cent on the total stock, and since

the stock is divided into about equal parts of preferred and common, the net income would have been less than two per cent on the preferred stock. Something is obviously wrong.

The company's operating ratio in 1915 was about 75 per cent. The average ton-mile rate was 7 mills and the average rate per passenger per mile was 1.95 cents. When compared with the average freight and passenger rates on eastern roads these rates do not seem low, but for the character of traffic handled by the Chicago Great Western they are entirely too low. It is the character of traffic handled and the rate received per ton-mile and per passenger-mile which explains probably in large part the high operating ratio. The average trainload of all freight was 574 tons in 1915, an increase of 62 tons, or 12.16 per cent as compared with 1914. This is a particularly good showing, especially in view of the fact that Mr. Felton points out that the movement of traffic in 1915 was most irregular, "so much so that no estimates could be made in advance so as to secure its most economical handling."

The loss in revenue from freight was entirely due to a lower ton-mile rate, the total ton mileage handled amounting to 1,378,500,000 in 1915 as compared with 1,364,000,000 in 1914. The passenger mileage handled totaled 157,642,000 as compared with



The Chicago Great Western

160,199,000 in 1914. The ton-mile rate in 1915 was 7.0 mills, and in 1914 7.3 mills; the rate per passenger per mile was 1.95 cents in 1915 and 2.00 cents in 1914.

The reorganization plan of 1909 called attention to the fact that gross earnings per mile on the 818 miles of the Chicago Great Western proper, exclusive of the 657 additional miles which the company leases and operates, were at the rate of \$10,202 in 1906 and \$10,830 in 1907. As a matter of fact, however, the average earnings per mile of road operated, including all of the mileage operated, were \$7,283 in 1906, and \$7,727 in 1907, and \$9,749 in 1915. The freight density in 1915 was 965,400 tons one mile per mile of road.

One other factor should be mentioned. The interest charges are very low, but the company has to pay a large sum for joint facility rents. This amounted to \$694,000 in 1915 and was an increase as compared with the previous year of \$133,000, or nearly 24 per cent. Taxes are also an undue burden. In 1915 they amounted to \$580,000, an increase over the previous year of \$81,000, and over 1909 of \$351,000, or 65.42 per cent. In 1915 \$498,000 was spent for additions and betterments to road and \$691,000 for additions to equipment. No new securities were issued during the year and the company had on hand at the end of the year \$2,776,000 cash, with no bills payable, comparing with \$2,577,000 cash on hand at the end of the previous year, with no bills payable.

President Felton, in his annual report to stockholders, says: "The average net income for the past six years has amounted to \$2,243,205. The decisions of the courts have indicated 7 per cent as a reasonable return on railroad property. If this amount is capitalized at 7 per cent, it would mean the value of the road and its equipment is but \$22,726 per mile. A physical valuation of the property, when completed by the Interstate Commerce Commission, in accordance with the present law, in all probability will disclose a value of at least double that amount. The 41 railroads in the western rate case showed a return at 7 per cent on but \$28,048 per mile in 1914. It would seem, therefore, that the efforts of the officers of this company and others in the western territory to secure increased rates were fully warranted. This situation has been placed before the various commissions and taxing bodies, and yet no substantial relief has been secured."

The following table shows the principal figures for operation in 1915 as compared with 1914:

	1915	1914
Average mileage operated.....	1,428	1,496
Freight revenue.....	\$9,645,527	\$9,956,308
Passenger revenue.....	3,074,050	3,205,992
Total operating revenues.....	13,920,685	14,349,739
Maintenance of way and structures.....	1,876,924	2,033,781
Maintenance of equipment.....	2,398,216	2,390,863
Traffic expenses.....	561,526	577,769
Transportation expenses.....	5,150,730	5,431,829
Miscellaneous expenses.....	85,868	79,354
General expenses.....	384,092	410,038
Transportation for investment—Cr.....	10,789	.....
Total operating expenses.....	10,446,567	10,923,634
Taxes.....	580,026	498,764
Operating income.....	2,889,931	2,927,341
Gross income.....	3,136,149	3,073,480
Net income.....	868,194	895,970

CHICAGO & EASTERN ILLINOIS

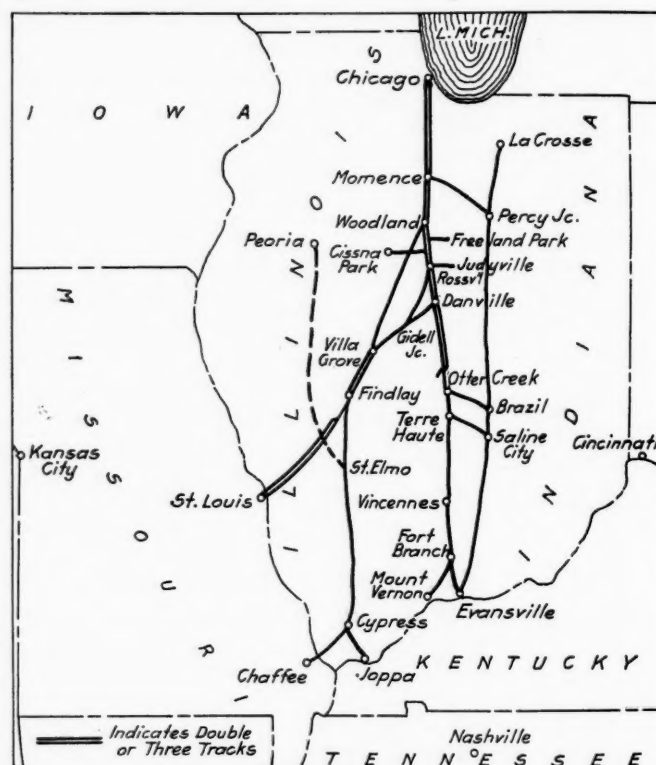
IT is hard to see why the St. Louis & San Francisco should have ever been willing to guarantee 6 per cent on the Chicago & Eastern Illinois preferred stock and 10 per cent on the common stock. In the fiscal year ended June 30, 1915, the Chicago & Eastern Illinois, which is being operated by a receiver, had a deficit, after providing for all fixed charges exclusive of anything on the stock, of \$1,844,000. Even so it did slightly better, insofar as operating income is concerned, than in 1914. The operating income, which is the amount available for rentals, interest charges and dividends, was \$1,967,000 in 1915, and \$1,917,000 in 1914.

The Chicago & Eastern Illinois operates 1,282 miles of road. This includes the Evansville & Indianapolis, which was taken over in 1911. In May, 1913, both the St. Louis & San Francisco and the Chicago & Eastern Illinois went in the hands of receivers. Previously the Chicago & Eastern Illinois was controlled by and operated in connection with the St. Louis & San Francisco, the Frisco having issued its own certificates of deposit for preferred and common stock of the Chicago & Eastern Illinois and guaranteed 6 per cent on the certificates issued for the preferred, and 10 per cent on the certificates issued for the common. In the fiscal year ended June 30, 1912—the first in which the Evansville & Indianapolis was included with the Chicago & Eastern Illinois—there was \$3,889,000 operating income, and the company paid 6 per cent on its preferred and 5 per cent on its common, leaving the remaining 5 per cent on the common to be made up by the Frisco. Operating revenues in 1912 amounted to \$15,216,000, comparing with \$14,211,000 in the fiscal year ended June 30, 1915. Expenses, on the other hand, amounted to \$10,900,000 in 1912, and to \$11,606,000 in 1915, but nearly all the difference was in the amount spent for maintenance. In 1915 \$2,253,000 was spent for maintenance of way, and \$3,172,000 for maintenance of equipment; in 1912 \$1,463,000 for maintenance of way, and \$2,778,000 for maintenance of equipment. Time has apparently proved that the maintenance charges in 1912 and the years following up to the receivership were not adequate for the upkeep of the property to the most economical standard. Transportation expenses in 1912 amounted to \$5,811,000, and in 1915 to \$5,375,000.

The Chicago & Eastern Illinois handles a large volume of

bituminous coal traffic, and also a large business of merchandise and manufactures originating in Chicago and other middle western cities destined for the South. The business depression, and especially the very severe depression in the South, caused a loss of revenue in 1915 as compared with 1914 of 9.1 per cent. The total tonnage of freight handled amounted to 12,733,000 in 1915, as against 13,804,000 tons in 1914. The tonnage of bituminous coal in 1915 was 6,587,000, or 51.73 per cent of the total tonnage, and in 1914 bituminous coal tonnage amounted to 7,477,000 tons, or 54.17 per cent of the total tonnage handled in that year. There was a falling off of 890,000 tons, or 11.90 per cent, in 1915 as compared with 1914. Total passengers carried amounted to 4,441,000 in 1915 as against 5,149,000 in 1914.

With a loss of 9.1 per cent in operating revenue there was a saving of 11.3 per cent in operating expenses, the total in 1915 being \$11,606,000. Transportation expenses amounted to \$5,375,000, which was \$541,000, or 9.1 per cent, less than in 1914. This was just commensurate, therefore, with the loss in revenue. The greater part of the saving was therefore through smaller expenditures for maintenance, and particularly maintenance of equipment. In 1915 \$3,172,000 was spent on this account, or 22.6 per cent less than in 1914. Undoubtedly 1914



The Chicago & Eastern Illinois

was an abnormal year for maintenance of equipment expenses, the receiver finding it necessary, probably, to spend large sums for deferred maintenance. The following table shows the percentage of each class of expenses to total operating revenues in 1915 and 1914:

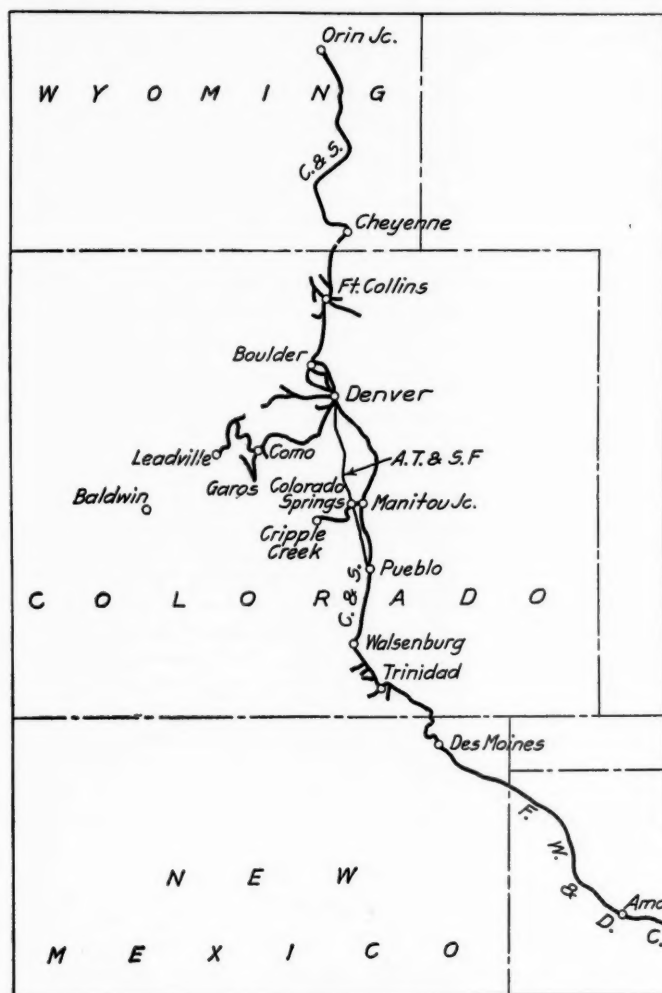
	1915	1914
Maintenance of way and structures.....	15.85	14.41
Maintenance of equipment.....	22.32	26.22
Traffic expenses.....	1.99	1.83
Transportation expenses.....	37.82	37.84
Miscellaneous expenses.....	0.67	0.71
General expenses.....	3.12	2.70
Transportation for investment—Cr.....	0.10	.....
Total.....	81.67	83.71

It will be seen that the maintenance of equipment expenses still take an unusually large proportion of operating revenues, notwithstanding the big cut in 1915 as compared with 1914.

The Chicago & Eastern Illinois received an average ton-mile rate on its revenue freight of 5.3 mills in 1915, and a passenger-mile rate of 1.84 cents. Both rates are very low, and this is

an important factor in the high operating ratio—81.67 per cent.

The court ordered the receiver, beginning March 25, 1915, to pay no interest on mortgage indebtedness, and further ordered in November, 1914, that no interest be paid on bills payable.



The Colorado & Southern

Of the \$4,395,000 interest and rentals accrued during the year, \$2,262,000 was not paid, and the receivers, therefore, had a surplus from operation of \$418,000. An extensive program of maintenance was undertaken on April 1, which included the laying of 10,000 tons of 90-lb. rail and the relaying of worn rail in light traffic lines, and this program was completed late this fall. With the improvement in condition of equipment, which was brought about by the taking up of deferred maintenance in 1914, and also to some extent in 1915, and with the improvement in the condition of roadbed and track, which has now been completed, the Chicago & Eastern Illinois ought to be in shape to handle traffic more economically than it did in the year ended June 30, 1915.

The following table shows the principal figures for operation in 1915 as compared with 1914:

	1915	1914
Average mileage operated.....	1,282	1,283
Freight revenue.....	\$10,295,909	\$11,324,292
Passenger revenue.....	2,755,021	2,963,222
Total operating revenues.....	14,210,602	15,633,625
Maintenance of way and structures.....	2,252,547	2,252,846
Maintenance of equipment.....	3,171,644	4,099,023
Traffic expenses.....	282,201	286,468
Transportation expenses.....	5,374,796	5,915,407
Miscellaneous expenses.....	95,756	105,956
General expenses.....	442,643	442,789
Transportation for investment—Cr.....	13,682	.....
Total operating expenses.....	11,605,905	13,086,489
Taxes.....	636,000	630,500
Operating income.....	1,967,224	1,916,636
Gross income.....	2,550,591	3,035,966
Deficit.....	*1,844,497	*1,525,892

* This deficit is arrived at after subtracting interest and rentals due. As a matter of fact, in 1915 the receivers did not pay \$2,262,000 interest due and in 1914 \$517,000 interest due.

COLORADO & SOUTHERN

THE Colorado & Southern's operating revenues for the fiscal year ended June 30, 1915, compared favorably with 1914 partly because that year was adversely affected by the Colorado Fuel & Iron Company's miners' strike and partly because of the large export grain movement which took place in 1915 via the gulf ports. The total operating revenues of \$13,223,000 in 1914 were the smallest in any year since 1906. In 1915 total operating revenues amounted to \$14,091,000; operating expenses amounted to \$10,011,000, comparing with \$9,746,000 in the previous year, and after the payment of taxes there was a net operating income available for interest charges, rentals, dividends, etc., of \$3,446,000 as compared with \$2,821,000 in 1914. This would be 7 per cent on \$26,700 per mile operated.

The Colorado & Southern owns a half interest in the Trinity & Brazos Valley, which runs from Ft. Worth, Tex., to Houston. The Chicago, Rock Island & Pacific owns the other half interest and the Trinity & Brazos Valley was put into the hands of a receiver in June, 1914. The Colorado & Southern received no interest on its investment in this property during the 1915 fiscal year, so that there was a loss of income from sources other than operation of \$455,000. The net corporate income available for dividends, after the payment of rentals and interest charges, was \$554,000. No dividends were paid and this amount was carried to the credit of profit and loss.

The increase in revenue was entirely from freight. In 1915 71 per cent of total revenues were from freight and 23 per cent from passengers. The total ton mileage in 1915 was 983,465,000, an increase as compared with the previous year of 107,337,000. Of the total in 1915 937,171,000 ton miles was on the standard gage lines and 10,294,000 on the narrow gage lines. The Colorado & Southern operates 1,522 miles of standard gage track and 318 miles of narrow gage. The freight density



on the standard gage is 639,000 tons one mile per mile of road, and on the narrow gage 32,000. The revenue per ton per mile from freight was 1.013 cents in 1915 and 1.033 cents in 1914. Of the total 6,450,000 tons of freight carried by the Colorado & Southern in 1915, 65 per cent originated on this system and 35 per cent was delivered to it from other roads. Of the total tonnage carried 23 per cent was furnished by bitu-

minous coal and 10 per cent by lignite. Either the ton-mile rate is very low or the average haul very short for lignite coal, since the tonnage was 10 per cent of the total tonnage, whereas the revenue was but 4 per cent of the total freight revenue. On the other hand, while the tonnage of bituminous coal was 23 per cent of the total tonnage, the revenue from it was 19.62 per cent. Of the total tonnage carried in 1915 24.84 per cent was agricultural products, and of this, approximately 60 per cent originated on the Colorado & Southern.

With an increase of over 12 per cent in the ton mileage, transportation expenses amounted to \$4,881,000 as against \$5,055,000 in 1914. The trainload of revenue freight on the standard gage averaged 318 tons in 1915 as against 302 tons in 1914. On narrow gage the average trainload was 75 tons in 1915 and 84 tons in 1914. The average for the entire system was 308 in 1915 and 291 in 1914. Carloading was very slightly better on the standard gage lines, but the principal gain in trainloading was made through longer trains. The average number of freight cars per train for standard gage was 25.55 in 1915 as against 24.46 in 1914. It is interesting to note that the passenger-train miles in 1915 were 2,550,000, a decrease as compared with the previous year of 272,000, comparing with a decrease of but 2.5 per cent in passengers carried one mile. The saving in transportation expenses was fairly evenly distributed among the primary accounts.

The company increased its outstanding debt by the issue of \$1,120,000 Fort Worth & Denver City equipment trust notes and the retirement of certain bonds under sinking funds, making the net increase in debt \$789,000. A total of \$1,111,000 was spent for additions and betterments, of which \$955,000 was for equipment. The principal items of new equipment were five Santa Fe type superheater locomotives with mechanical stokers and 10 Mikado superheater oil-burning locomotives and 1,200 steel center sill box cars. At the end of the year there was \$1,562,000 cash on hand, with no loans and bills payable.

The table shows the figures for operation in 1915 and 1914:

	1915	1914
Average mileage operated.....	1,840	1,866
Freight revenue	\$9,960,044	\$9,053,885
Passenger revenue	3,294,688	3,345,489
Total operating revenues.....	14,090,516	13,222,737
Maintenance of way and structures.....	1,728,254	1,818,146
Maintenance of equipment.....	2,691,585	2,184,784
Traffic expenses	215,446	216,445
Transportation expenses	4,881,074	5,055,016
General expenses	494,489	471,611
Total operating expenses	10,010,848	9,746,003
Taxes	616,053	638,450
Operating income	3,445,566	2,821,328
Gross income	3,903,442	3,711,731
Net income	553,767	406,151
Dividends		340,266
Surplus	553,767	65,885

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Part 2 contains the 25 technical papers presented before the same meeting with discussions. Among those papers of special interest are: Battery Zincs; Some Causes of Defective Service, by Robert Job and F. F. White; The Effect of Finer Grinding and a Higher SO_2 Content Upon the Physical Properties of Portland Cement, by P. H. Bates; A Fungus Bed Test of Wood Preservatives, by Cloyd M. Chapman, and The New Physical and Chemical Laboratory of the Pennsylvania Railroad Company at Altoona, by C. D. Young.

These volumes are arranged and printed to the same high standards governing previous proceedings of this society.

Letters to the Editor

CHEMICAL FIRE EXTINGUISHERS

MOBILE, Ala.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Referring to pages 691, 692, 693 and 694 of your issue of October 15, 1915, giving an account of the second annual meeting of the Railway Fire Protection Association in Chicago, October 5-7, 1915, I beg to direct your attention to comments on the report of the committee on hand fire extinguishing apparatus shown on page 692, reading in part as follows:

"From data secured in reply to questions sent out, it was found that all roads agree on the value of the chemical extinguisher and barrels and buckets, 55 per cent of those reporting stating that they do not use this apparatus and 50 per cent of those who do use them state that they are not recommended."

The percentages referred to above had reference to the hand grenades and the dry powder type and not to the chemical extinguishers or barrels and buckets. For your information I quote the following from the committee's report:

"From data, secured from members of the association in reply to questions sent out, it is determined that all the roads agree on the value of the chemical extinguisher and barrels and buckets as standard forms of first-aid apparatus, and that nearly all of them agree on the undesirability of the hand grenades and dry powder type, 65 per cent of those reporting stating that they do not use this form of apparatus and 50 per cent of those who do use them state that they are not recommended."

C. B. EDWARDS

Secretary, Railway Fire Protection Association.

THE CAB SIGNALS AND AUTOMATIC STOPS AT OROVILLE

SAN FRANCISCO.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Your issue of October 29 contains a letter under the heading, "Oroville Signalling Criticized," signed "M. Tainer." The letter contains so many incorrect and unwarranted statements that without desire for controversy, some reply is needed. Criticism is expected, but it is only right also to expect it to be made in a spirit of fairness and based on thorough knowledge of all details of the system and of its operation, tests and records. The letter in question does not show that spirit of fair play to which we are justly entitled, nor is its writer competent to pass judgment without much greater familiarity with the system and its appliances than he has had opportunity to acquire. The latter part of his first paragraph condemns expenditure in the effort to improve conditions for safety in railway operation and is indicative of the narrowness of his criticisms following. The few who have joined in financing this particular effort are not of small caliber and are well satisfied with the success already attained.

"M. Tainer" states that our devices are arranged on the open circuit plan and implies that they will not detect their own failures. Both statement and implication are entirely wrong. The system is *not* arranged on the open circuit plan. The description published in your issue of October 8 does not disclose in detail the methods of protection used. Complete information on this point was not given on account of certain pending patent applications. All of the circuits used, on engine and roadside, are arranged entirely as closed circuits. The apparently normally open contact at signal locations is thoroughly protected against failure in operation by a protective relay positively connected across the point into normally closed circuits. Two prominent signal engineers, after examination of our circuits and inspection and tests of our relays, have been satisfied that our protective features are effective and reliable and free us from any danger in the use of the contact point in question. The open circuit practically does not exist in this system.

The apparatus on the engine is far from being complicated

and we have been unable to detect any point in it where any weather conditions can have detrimental effect upon operation. The energization or action of the magnets cannot be affected by the severest cold or frost, nor can the magnetic current induced be scattered or interfered with by snow, ice, water or mud lying in its path. The engine signal-valve and the train-stop appliance are not subject to moisture or lubricatory troubles through extreme cold. The air system is less liable to troubles than much of the Westinghouse. All circuits and instruments are fully equal to the best in use under extreme climatic conditions.

The line circuits, except in overlap, require less wires than for semaphore signals, two wires for the three signals and the automatic stop, as against three wires for the three-position semaphore. As to cost of an installation, we are in better position than "M. Tainer" to make comparisons and can state that the complete system, including all road and locomotive equipment, can be installed per railroad district or division at the same or lower cost than a good semaphore system covering the same conditions.

Current consumption is not in excess of that required for semaphore signals. It is to be noted that the setting of signals ahead of and behind a moving train requires no extra current consumption, such setting being obtained simply by the opening or closing of the line relay circuits. Practically no current is consumed by track magnets except for the very brief interval of actual delivery of a signal, a period of ten to fifteen seconds for delivery of current of five amperes at ten volts.

Failure of contact 35 to close when it should, or failure of relay 9 to pick up its armature through exhaustion of battery 26, have been absolutely covered in our protective system earlier referred to. The working of the back-contact has been made more certain and secure than the front-contact of any type of relay now in service. The wiring of the engine equipment is so arranged as to effectually guard against any failure of the apparatus through cross connections and this has been amply demonstrated in actual practice. Also the air system is so arranged that the breaking or leaking of any pipe or connection will cause instant and positive indication of the leak.

As to overlap, we make no argument for or against its use. That is beside the question since the one overlap of the Oroville installation is provided solely to meet certain conditions and limitations which would similarly control in a semaphore system under the same conditions and space limits. This overlap has no bearing whatever on the location of automatic stops, a fact not grasped by "M. Tainer." In a cab-signal system the locations for giving signals are of necessity quite different from those used for giving roadside signals. The cab-signal must be given at the point where the semaphore signal ordinarily comes first into clear view. In either system the spacing between signals is the same, giving the engineer equal time in each to act on one signal before receiving another. In this installation the stop signal is received in the cab at braking distance in advance [rear] of the usual semaphore stop signal location and the automatic stop is given at this semaphore, provided the train is run past this point, the block end being at braking distance beyond. The overlap, whether good, bad or indifferent, is no more an essential part of this system than it is of the roadside signal system. We do not claim that the Oroville installation is an ideal one. It is too limited in extent and too hampered by present unusual district terminal conditions to be held as a model. Its chief purpose is to demonstrate that signals and brake applications can be successfully and reliably transmitted to moving trains without the use of mechanical or electrical contacts with roadbed apparatus and operated without disarrangement or improper delay of traffic. We are prepared to successfully demonstrate these essential points and with greatly increased safety in railway operation; also to show that the system can be so arranged and operated as to give complete protection everywhere.

In this installation the upper surface of track-magnets is $1\frac{3}{4}$ in. above the top of rails and the lower face of receiving-coils is 3 in. above the upper surface of track-magnets, giving the receiving-coils a height slightly above the maximum height of pilot above

rails as used on this road. The clearance between track-magnets and receiving-coils may be materially increased by lowering the track-magnets, with reliable transmission operation still assured. Also track-magnets may be placed with their upper surfaces even somewhat below the rails' upper level and the receiving-coils considerably lowered before reaching a level where reasonable plow protection cannot ensure their safety.

The action of the dashpots of the time-limit relay has been proved perfectly regular and reliable. Humidity and temperature have no effect upon them and no lubrication or packing of any kind is used in them. They consist simply of a graphite piston running true in a polished bronze cylinder. After long use no wear is perceptible.

The liability of non-operation of armature 14 of relay 9 and contact 35 has been fully guarded and covered in the protective features previously noted.

The use of time-limit relays is essential for economical battery consumption in the case of roads using energy supplied from any form of battery, but this form of relay may be dispensed with when current is derived from a power plant, as the increased current consumption occasioned by its non-use is then not sufficient to greatly affect the economy of the system. This particular relay has, however, been developed to the point of entire reliability under heavy use. They very closely resemble the ordinary free-acting type and particular care has been taken in design and construction to make all parts of this instrument extremely free working, to guard against any possible chance of sticking.

The use of the local track circuit where one rail is common to two circuits has, under our provisions, proved perfectly reliable. We have been able to completely guard against failure from the varying condition due to poor insulation, broken or loose connections, broken rails, etc. This short track section is not expensive in installation or maintenance. Under our arrangements it does not introduce complications or interference with connected track-circuits.

The attention of the engineer need not be at all diverted from his watch ahead, in order to observe the cab-signals. He cannot well escape noting the light signal given above or beside his forward window and he cannot fail to hear and recognize the signal also given by the whistles of distinctly different tone. The single act needed to stop both light and whistle is performed without taking his eyes from track or gauges.

The substitution of cab-signals for wayside ones does not make difficult a check of the display of signals. The use of a very simple and inexpensive recording device not only makes such a check possible, but establishes an indisputable record.

We have had no trouble in obtaining satisfactory maintenance. In our experience with this system, the maintainer of average ability has no difficulty in locating troubles and in determining, when the trouble has been located, whether or not it has been removed.

It would be unwise to place sole dependence on cab-signals and we do not do so. "M. Tainer" has overlooked the two-light marker placed at each automatic-stop location. This marker displays continuously the clear signal when the block ahead is clear, or a stop signal if the block ahead is occupied. More than braking distance is provided from the distant point at which these marker lights are clearly visible, before the block end can be reached. Even were the entire signal apparatus disabled, the engineer still has the marker at each automatic-stop location to guide him. Only by a serious accident to the locomotive could all the signal-indicating apparatus and the automatic-stop appliance be rendered non-operative. Means have been provided for readily cutting out any section where trouble develops without interfering with other sections. The locomotive apparatus has proved more reliable in operation than semaphore arms, according to the records of semaphore performance.

The statement made that the automatic stop should not be applied when speed is being reduced to bring the train to a stop before the home signal is reached is correct. As has been stated, in the Oroville installation, the automatic stop is placed at the home signal and the stop operated there should attempt be made

to pass that point with the home signal set at stop. If desired, however, an automatic stop can be located at any point in advance [rear] of the home signal and its action regulated to pass a train running at such reducing speed as will bring the train to a stop at the home signal. Further, in this system, when brakes are applied by the stopping device, their release is impossible until the train has been brought to a stop. The stopping device gives only the service application and the engineer is not prevented from increasing the application; but he cannot decrease it. This automatic stop feature may separately—that is, without the cab-signals—be applied as an auxiliary device to any existing semaphore installation and be non-operative unless the attempt is made to run past a semaphore stop signal or be made operative only at a predetermined rate of speed.

In conclusion, we desire to go on record as fully recognizing the vital importance of heeding the final judgment of practical and conservative signal experts in the fundamental principles governing design, construction and operation of circuits and apparatus. It is our constant effort to fully meet and cover all such established rules and principles. This we believe we have accomplished and on this basis we claim the right of fair and unprejudiced consideration, an element entirely foreign to the letter signed "M. Tainer."

F. F. BOSTWICK

President, The National Safety Appliance Company.

AN ANSWER TO "A CLERK'S PLEA"

CHICAGO, ILL.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Having been employed for some 12 or 14 years in various clerical capacities and in different departments by several of the more important transportation interests, I am keenly interested in the subject discussed in the letter published in your issue of September 10, page 459, and fully agree with the statement that the inefficiency of railroad employees is an issue that warrants the serious consideration of executives and officers.

The indictment in this plea is puerile, and leads one to believe that the author has grossly exaggerated his lack of knowledge of certain movements designed to develop efficiency. Surely no one, unless he has spent his time at some lonely whistle station in the West, would be uninformed as to the mediums existing for this purpose.

Railroad employees may be divided into two classes; so may all other employees, so are bees in the hive—workers and drones. There are those employees who place their employers' interests (even though it be a corporation) above their own, realizing that their success is contingent to a great extent on the success of operation and cherishing the hope that their efforts will be recognized and rewarded; and they frequently are. There is also that class who regard their position as a place "in out of the wet" and are incapable of diverting their minds from their pleasures, the clock and pay-day.

To my mind it is inconceivable that the efforts of various educational institutions, publishing houses, railroad journals and others have fallen on barren ground, and I am positive that the public at large is well informed with respect thereto and that this clerk may be the exception that there is to all rules.

In regard to the matter of schools, there is hardly a university in the country that does not have a course covering some phase of transportation and commerce. There are also several correspondence schools devoting their activity to the development of efficiency in certain of the many branches of railroading. The fees charged are nominal and the item of expense is not sufficient to deter an ambitious railroad man from acquiring knowledge that will stand him in good stead.

As to books, there are so many that every phase of railroading from the clipping of coupons to the destruction of weeds has been well covered. Many of these books are to be found on the shelves of the public libraries of even the smaller municipalities. There are also excellent addresses given by prominent men in transportation work, from time to time, which are reported through the medium of the daily press, periodicals, etc.

To my mind, the solution of this question rests primarily on three things: The elevation of the educational and moral qualifications for admission to the service, the pursuit of a special educational plan with regard to those now in the service designed to promote their greater efficiency and familiarize them with the practical and economic questions concerning their vocation, and a fair and impartial basis of reward for their efficiency.

Two barriers to rapid advancement that I have noted are the observance of seniority in filling vacancies and the fact that certain desks are paid rather than their incumbents. As to the former, the mere fact that a man may have served 10, 20 or 40 years in a given office or department is not conclusive evidence as to his efficiency. Indeed, it is sometimes stated that this in itself is proof of inefficiency and lack of ambition. Be that as it may, if the higher positions are filled by men of this sort of avenues of progress are effectively closed to the ambitious employee.

Under the desk payment plan, the management may decide that the maximum figure for tariff clerks will be \$100, for rate quotation clerks \$75, for stenographers \$60 and so on. Irrespective of how efficient an employee may be who occupies a position in one of these classes, the possibility of his securing additional money in that particular position is precluded by this policy, the wisdom of which is open to question. It is not surprising, therefore, that an employee, finding his advance hard and being unable to obtain any additional remuneration or broaden his experience in connection with the duties he is now efficiently performing, begins to lose interest and may finally cast his lot with the incompetents.

The business of the railroad is manufacturing and selling transportation, and the lowliest employee to some degree assists in the sale of that product, and his inefficiency is frequently responsible for a loss which has no place in a well-organized and a well-regulated business.

Through the medium of the universities, the correspondence school, etc., a quantity of desirable timber is placed in the field annually, and seemingly the man who has bought, paid for and completed a vocational course should be given the preference over others who are not so equipped. Most all companies are engaged in some way or another in an educational plan to develop employees. For the most part this has been confined to machine shop practice and operating department employees by the apprenticing of student employees. Several lines, however, have a well-developed course in transportation embracing varied subjects, which is at the disposal of such employees as are inclined to take up the work.

In conclusion, I offer a suggestion which comes from the clerks themselves through a publication of theirs: "During the dull or ordinary times clerks should be shifted from one position to another, so that they may become familiar with the various tasks necessary to the running of the office. In busy seasons such training may make comparatively easy an increase of the force in some departments and a decrease of the force in others, thus reducing and eliminating the necessity of discharging experienced workers. When new workers are added only minor positions will be affected, and the net results will be the lessening of the total yearly mistakes." This plan also has its advantages in that it may uncover a man who is not particularly fitted for the position he may be occupying but is an exceptionally efficient employee on some other work in the same department.

The writer is convinced that the efficiency of the office rank and file may be greatly enhanced by the utilization of effective educational methods and mediums now available, and from the progress made in the past it is probable that the transportation interests will not fail to place their approval on these methods and thereby elevate the railroad job to the dignity of a profession.

L. E. RILEY

La Salle Extension University.

Transverse Fissures the Result of Rail Gaggling

Intergranular and Coalescent Types Caused by Local Application of Gag to Base and Head of Rail Respectively

By P. H. DUDLEY

Consulting Engineer, New York Central Lines.

The cold straightening of rails after they leave the hotbeds is an important subject. The value of smoothness and stability of track has been recognized by railroad officials for many years, as indicated by the large outlays for stiffer rails, sufficient ballast, and efficient labor to maintain the surface of the track.

To make the present steel rails with large mechanical properties as girders is a series of theoretical and practical problems, and the old adage, "strike when the iron is hot," is true of each

transitory deflection to their position in the equilibrium depression under the passing wheel loads, but the undulations decrease with the increased stiffness and smoothness of the rails on the same roadbed.

Fig. 9 is a track indicator diagram of the surface undulations of the N. Y. C. & H. R. 4½-in. 65-lb. rail used in 1881. This had a narrow deep head, made from the recommendations of a committee of the American Society of Civil Engineers in 1873.

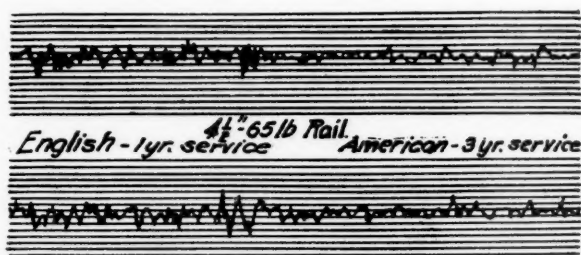
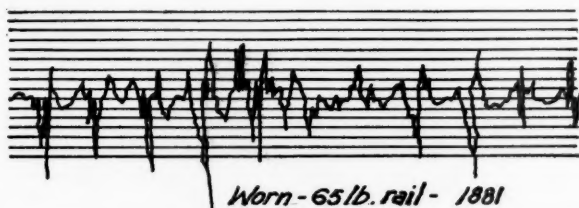


Fig. 9.



Worn - 65 lb. rail - 1881

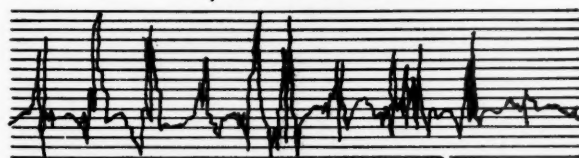
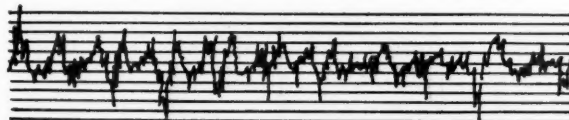


Fig. 10.

stage in its logical order—selecting the ores, smelting them in the blast furnace, making the steel in the open hearth furnace, teeming the ingots, stripping, then promptly charging them into the reheating furnaces, blooming the ingots, reheating the blooms, rolling the blooms into bars at suitable temperatures, hot sawing the rails, cambering, cooling and recalcence on the hotbeds, then cold straightening, inspecting, drilling the rails and loading on cars for shipment. The rails are then laid in the tracks where the metal of the section receives the "Twentieth Century" or other trains through the individual wheel loads, carries and distributes the strains in ample length of the section to the cross-ties, ballast and roadbed at 60 or more miles per hour, which can be repeated many times daily for years of service.

The raising of the standards of the track and the introduction of stiffer rails to accomplish this, is interesting history which can be illustrated by diagrams of my track inspection for a number of years. These will be limited to the indications of the surface undulations and joints of the two lines of rails which have been copied from my report in the Proceedings of the International Railway Congress, Sixth Session, Paris, 1900, where more complete diagrams of track inspections are reproduced.

These show the effect of the flexible roadbed inaugurated by John B. Jervis in 1832 after he opened the Mohawk & Hudson Railroad, Aug. 9, 1831, constructed with rigid supports for his strap iron rails. This is in the sense that, from the trackman's surface, the rails, crossties, ballast and roadbed undergo a



Worn 65 lb rail - 1881

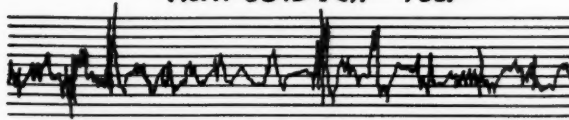
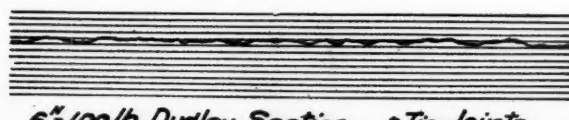


Fig. 11.



6"-100 lb. Dudley Section - 3 Tie Joints.

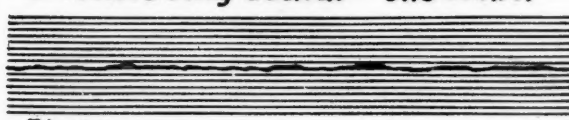
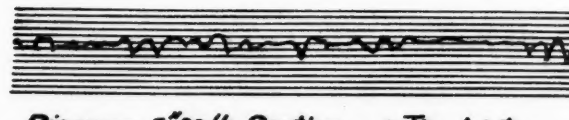


Fig. 16



Pioneer 5"-80 lb. Section - 3 Tie Joints.

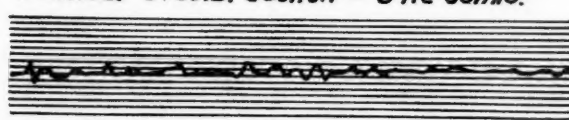


Fig. 17

Track Indicator Diagrams of Various Rail Sections Showing Their Surface Undulations

The spacing of the horizontal lines for the vertical undulations of the rails by the track indicator was 1/10 in., and the scale for length, 1 in. of paper to 50 ft. of track. These have been reduced about one-half in the illustrations.

The first part of Fig. 9 is a diagram of English rails, hot straightened, while the smoother part is of American rails which had been in service three years. The American rails were all cambered as they came from the rolls, and the general surface was smoother than that of the English rails.

Fig. 10 shows rails which had been in the track for several years; the joints were low and the receiving ends cut out, while a few of the rails were rough originally. The diagram was representative of the condition of tracks of light rails from 1878 to 1884 on the trunk lines, after about 8 to 10 years' service. Then the rails were taken up, the receiving ends cut off and redrilled, and the rails were relaid.

Fig. 11 shows rails with some receiving ends cut out at the

joints, though the rails themselves had a wavy surface. The crossties under all of these $4\frac{1}{2}$ -in. rails cut out under the seats and were destroyed by mechanical abrasion rather than decay. The generated dynamic wheel effects were large for moderate speeds. There was a general opinion among operating officials between 1870 and 1885 that the dynamic shocks on the iron and early light steel sections were nearly in proportion to the square of the speeds, and freight trains were limited to 12 and 15 miles per hour. Freight train crews which exceeded 16 miles per hour were disciplined on some roads.

We are unable to appreciate the difficulties of operation of the railroads on the early tracks, from our present standards. My track indicator ran over a few rail $4\frac{1}{2}$ -ft. lengths of the early fish-bellied rails with mitre chair joints, in a siding of the B. & A., and the average undulations were at the rate of 41 ft. per mile instead of 2 ft. in our best tracks. I ran over



Fig. 18—Intergranular Type. This illustrates the General Type of the Intergranular Nucleus and is the More Common from the Fact That Rails Are Cambered as a Rule to Cool Low on the Hotbeds and Then Gagged Upon the Base

a few miles of 12 to 18-ft. iron rails, with chair joints, on the poorest track, and the undulations average 27 ft. per mile. Each joint gave severe shocks and the speed was limited to 12 miles per hour for the light equipment.

Fig. 17 shows the diagram of the N. Y. C. & H. R. pioneer 5-in. 80-lb. section, rolled by Capt. Hunt at Troy, in April, 1884—a short period for the present development. These rails Capt. Hunt was obliged to straighten upon short span supports, the same as had been used for the limber $4\frac{1}{2}$ -in. 65-lb. rails. The surface was "kinky" and the trackmen were never able to surface those rails to the value which was expected from their stiffness. They were removed from the high speed tracks as soon as smoother rails were obtained at the mills. When a sufficient mileage of the 5-in. 80-lb. rails was laid—over 60 per cent stiffer than the former $4\frac{1}{2}$ -in. 65-lb. section—the "Empire State Express" was installed on October 26, 1891.

I estimated and stated upon the condensed diagrams of the track inspection of the Boston & Albany in 1883 that with the stiff, smooth rails and good ballast they could reduce the undulations in their tracks to between the 15th and 16th lines on my condensed diagrams. This was after I had designed the N. Y. C. & H. R. 5-in. 80-lb. rail, but before it was rolled.

I distributed the metal in the B. & A. 95-lb. section in 1890, commenced rolling it in 1891, and completed the entire line in 1897. The undulations for the 400 miles of track were nearly uniform on the heavy gradients and averaged 15.42 lines on the condensed diagrams, confirming my estimate of 1883.

When I rolled the B. & A. 95-lb. section in 1891 and the

stiffer sections of the $5\frac{1}{8}$ -in. 80-lb. and the 6-in. 100-lb. rail, with several others, in 1892, I had stipulated in the specifications that the supports in the straightening presses should be widened from 24 or 30 in. to 40 or 44 in. This resulted in a smoother finished surface and line of the rails than previously secured. The knowledge of what could and should be done was an important factor in securing the desired results.

Fig. 16 is the track indicator diagram of the 6-in. 100-lb. Dudley section in which the vertical undulations of the track were less than $1/10$ in. The surface of the rails in the track was comparatively smooth, and the joints are not even indicated. The undulations in the track, which averaged 8 ft. per mile on the light rails in 1881, were reduced to 2 ft. per mile in 1892 by the use of the 6-in. 100-lb. rails on the same roadbed, with an added threefold capacity and stability of the track.

The determinations of the stremmatograph of the unit stresses in stiff rails under the subdivided wheel loads of the present heavier equipment show their favorable distribution through the metal of the section to the crossties and roadbed. These determinations furnish the explanation of the increased capacity and stability of the track of the 6-in. 100-lb. rail on the same roadbed over the former light sections as a more efficient engineering structure to distribute the effect of the wheel loads to the roadbed.

The knowledge acquired in the past 31 years in the design and use of stiff sections of steel rails to develop the high standards of track shows that the rails which are not smooth in the bearing surface of the head cannot be laid and maintained in surface by the trackmen as desired and expected from the stiffness and weight of the section. This is a condition of



Fig. 19—Coalescent Type of Interior Transverse Fissure. Transverse View Showing the Nucleus—a Crack Under the Bearing Surface. Rail Gagged on the Head

the steel beyond the ability of the trackmen to correct, which is intensified yearly by wear and deformation of section until the rails require renewal for smooth riding track.

To maintain the present rate of progress secured in transportation for the past quarter of a century improved methods are now required to finish the stiff rails without surface irregularities or injury to the metal. The hot stiff rails should be cambered to cool uniformly on the hotbeds, and these should be provided with automatic mechanism to space and move forward one rail at a time so that each can bend back and forth during the recalcence of the base, and then the head, without contact with adjacent rails. This needed improvement in the finish of the rails must be done through the study and co-operation of the manufacturers and consumers to produce the definite effect of smooth rails without unduly stressed metal. Each party to make and use a rail must know and be familiar with what has and can be done and the limitations, or misunderstandings will replace what should be mutual work and confidence. The consumers use and make the service tests, while the results of the past trials must be returned to the manufacturers with analysis of the facts and the reason why the conditions of service tests were not fulfilled as required for the progress of transportation.

The design of rail sections of large mechanical properties for the necessary girder stiffness and strength, involves an increase of metal, and therefore requires a higher degree of perfection of the mechanism to finish properly the stiff rails, essential for present and future transportation. Those with even heavy bases when spaced, do not cool sufficiently straight on the hotbeds to be used without correction, while the irregularities of cooling nearly straight are increased when the rails are bunched on the hotbeds.

To straighten either low or high rails from the hotbeds, of any section, the principle involved is that the metal of the neutral surface of the section does not change its length, while that above or below it must; that when the metal of the head requires to be lengthened, the base must be shortened, and that when the head requires to be shortened, the base must be lengthened. The present method is to apply the gag locally to put a permanent set in the metal, but it concentrates its effect in two or three inches of the head or base, and therefore puts and leaves internal strains in the metal where the gag is applied. These, when severe, often develop in service into half-moon breaks in the base, sometimes resulting in the complete fracture of the rail. The gag applied locally is one of the contributory causes for the development of the interior trans-

central core to make them hollow sometimes develop an interior transverse fissure from a slightly serrated surface on the wall of the hole in the drill. Pneumatic tamping bars of high grades of steel which have been broken and then repaired by "V" welds, the entire surface not being completely united, have also developed interior transverse fissures from the imperfect portions of the weld, and fractured the rods.

The coalescent type of interior transverse fissures develops



Fig. 20—Top View of Rail, Shown in Fig. 19, Uncapped and Sawed Twice to Uncap the Full Imprint of the Gag

verse fissures, the intergranular type when applied to the base (Fig. 18), and the coalescent type, when applied to the head (Figs. 19, 20, 21 and 22).

The improved method desired is, more efficient hotbed control, then mechanism to distribute its work to straighten the rails equally to each inch of length respectively of the head and base.

The gag applied locally on the head of the rail to straighten it, must produce longitudinal shearing strains under the bearing surface to upset and shorten the metal. When there are delayed transformations in the head of a rail from the higher metallographic entities to those of the lower temperatures as the hot rail cools, the gag subsequently in cold straightening may leave its imprint and uncap the nonductile metal.

There is still confusion in the minds of engineers of maintenance of way in reference to the interior transverse fissures, for they often designate those as "transverse fissures," which are of an entirely different character and origin. The interior transverse fissures develop from an injury or defect in the interior of the head, while a "transverse fissure" in the rail head develops from metal hardened in the bearing surface under slipping drivers, which becomes checked, and then by slow detail develops downward through the head and web, until the entire section may be fractured.

The development of "transverse fissures" in pneumatic tamping bars and drills, usually occurs from a slight defect in the exterior of the metal. Drills made from steel cast around a



Fig. 21—Coalescent Type of Interior Transverse Fissure, Gagged upon the Head. The Crack or Nucleus Shows Beneath the Bearing Surface

from a longitudinal imprint of the gag or uncapping of the nonductile metal. The metal of the edge of the crack, $\frac{3}{8}$ to $\frac{1}{2}$ -in. under the bearing surface, checks and becomes the nucleus, and by its coalescence starts the development of the vertical interior transverse fissure, which finally fractures the rail. It is characteristic of the coalescent type that the development of the verti-

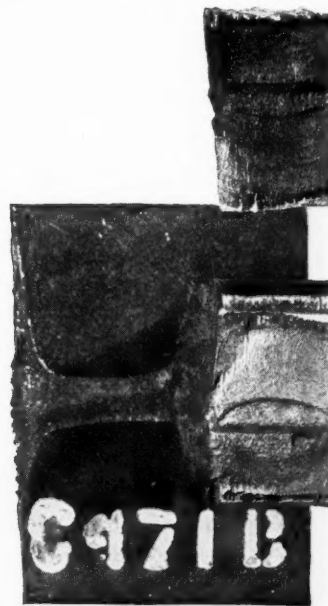


Fig. 22—Top View of Fig. 21, Showing Imprint of the Gag on the Rail Head, with Cap Above

cal interior transverse fissure follows the internal shearing strains of the edge of the gag nearest to the supports of the straightening presses. Therefore, while we find a similarity of effect, we must expect slightly different traces of its manner of coalescence and subsequent development.

I have, for the New York Central Lines, sent several

assistant supervisors of track who are technical graduates, to the steel mills to take a short course in the manufacture and inspection of rails, which is of great service to them in their maintenance work. They become familiar with the successive steps of manufacture and their significance to the service of the rail as a girder in the track to carry the moving equipment, and when they see the rust spots on the new rails in the track, they know they are the local permanent sets in the metal, produced by the gag to straighten the rails by the present method. This enables them to follow and criticize and understand my investigation of the contributory causes and classification of the intergranular and coalescent types of interior transverse fissures.

The education of 25 years with locomotives with increased total loads subdivided by more wheels and similarly constructed equipment running over the smooth rails, proves that lessening the undulations of the track, reduced the generated wheel effects, therefore train resistance, and rendered possible the increase of more than an equivalent percentage of paying loads on the same roadbed, essential to reduce the cost of transportation per pound or ton, the revenues of which are restricted by law.

It has taken years of service to realize what was indicated by theory and calculation, and then secured only by attention to every detail of manufacture of rails, equipment and their use, which must still be continued.

NATIONAL INDUSTRIAL TRAFFIC LEAGUE

The annual meeting of the National Industrial Traffic League was held at Chicago on November 17 and 18. A special committee, of which F. B. Montgomery, traffic manager of the International Harvester Company, was chairman, presented a report and a resolution, which was adopted, declaring the league to be in favor of the upbuilding of the American merchant marine under the authority of Congress. The report expressed the opinion that the United States should have a merchant marine comparable with that of other large maritime nations, in time of war to be subsidiary to the navy, and that there is little or no prospect of such a merchant marine being constructed and operated within the next several years by private capital. Therefore, the committee felt that the only apparent method at this time of securing a merchant marine of any appreciable number of boats is to support the administration in its recommendation that the government either construct, maintain and operate a merchant marine or furnish sufficient capital to build a reasonable number of boats to be leased to private individuals or corporations.

A special committee was appointed to consider the question of the liability clause in sidetrack leases and agreements. It was stated that the railroads are inserting in their new leases a clause which imposes liability upon the shippers for almost anything that may happen on the property.

On the recommendation of the Legislative Committee the league went on record in favor of the proposal to reorganize the Interstate Commerce Commission by the appointment of two additional members and the organization of the commission into divisions or departments. On the subject of the right of appeal from negative orders of the Interstate Commerce Commission, which had been on the association's docket at several meetings, after a general discussion it was agreed that apparently the shipper has an equal right in this respect with the carrier, and it was decided to take no action. At the recommendation of the committee, the president of the league was authorized to communicate with the Interstate Commerce Commission to see if there is any objection to a plan for amending the law or rules of practice of the commission to give litigants the right to review findings of examiners, and file exceptions and objections prior to the decision by the commission. The Legislative Committee was also instructed to follow the proposed legislation to increase the liability of ocean carriers. It was decided to lay on the table the subject of a uniform code of track storage rules, it being the sense of the meeting that such rules should give consideration to local questions.

In connection with the report of the Bill of Lading Committee, the previous action of the league in favoring a clean bill of lading, a simple common law receipt for freight, was reaffirmed and the committee was instructed to endeavor to secure a consolidation of the proposed hearings on export and domestic bills of lading.

The Freight Claim Committee reported that the Freight Claim Association of the carriers had called a conference to consider the entire subject of concealed loss and damage to freight, to be held on December 15, to which representatives of the shippers were invited, and a special committee of seven was appointed for this purpose. The committee reported progress on its compilation of a manual of instructions for shipping clerks and the committee was authorized to proceed with its publication, with the approval of the executive committee. Several letters had been received from representatives of the carriers, expressing a willingness to co-operate in the work.

The Classification Committee reported concerning the reorganization of the Official Classification Committee as a permanent standing committee, and expressed the approval of the league, which had advocated such a plan and has urged the Southern Classification Committee to adopt a similar plan. A report of the committee opposing the unit basis for establishing classification ratings was adopted.

J. M. Belleville, who attended the recent meeting of the National Association of Railway Commissioners as a special representative of the league, made a report suggesting greater co-operation between the league and the association, and between the chairmen of committees of the two associations on subjects in which the league was interested. At the San Francisco meeting he had been given the privilege of the floor and had participated in the discussion of all subjects in which the league is interested. It was proposed to send the chairmen of all of the league committees to attend the next meeting of the association.

A special committee on the handling of l.c.l. freight at transfer points reported that it had found many cases of delay due to operating conditions, in which cars were not handled in the order of arrival. It was decided that this was a question pertaining to the operating department, and the subject was referred to the executive committee to take up with the American Railway Association or other representatives of the carriers.

The Committee on Uniform Classification reported regarding the progress of the Uniform Classification Committee of the carriers, saying that it was proceeding as fast as the territorial classification committees can assimilate its work.

The Committee on Weighing submitted a report on the code of rules for the weighing of l.c.l. freight proposed by the American Railway Association, recommending that they be adopted with two minor changes. The report was adopted with instructions to the committee to continue its negotiations with the American Railway Association.

On the recommendation of the Legislative Committee, the Executive Committee was instructed to bring the subject of reparation to the attention of the Interstate Commerce Commission, with the representation that in every case where a rate is found unreasonable, complainant should be awarded reparation from the date of his complaint, at least, and that in every case involving the question of reasonableness of rates where reparation is asked the Interstate Commerce Commission shall be asked to fix the point of time at which the rates became unreasonable.

The annual dinner of the association was held at the Congress hotel on Wednesday evening. E. J. McVann, manager traffic bureau, Commercial Club of Omaha, spoke on the work of the league, and Col. George T. Buckingham, president, Chicago branch, National Security League, spoke on the subject of Preparedness.

Officers for the ensuing year were elected as follows: President, G. M. Freer, manager traffic department, Cincinnati Chamber of Commerce; vice-president, W. H. Chandler, manager transportation department, Boston Chamber of Commerce; secretary and treasurer, O. F. Bell, traffic manager, Crane Company, Chicago.

The Economical Handling of L. C. L. Freight Traffic

The Two Prize-Winning Papers Received in the Contest Which Closed August 1. Practical Plans Described

Thirty-seven contributions were received in the contest on the Handling of L. C. L. Freight, which closed August 1. These papers were turned over to T. J. Foley, general manager, Illinois Central; E. H. Lee, vice-president and chief engineer, Chicago & Western Indiana, and C. B. Rodgers, assistant to vice-president, Chicago, Burlington & Quincy, who awarded the first prize to C. B. Anderson, agent, C. & E. I., Chicago, and second prize to C. G. Johnson, supervisor of station service, M., St. P. & S. S. M., Minneapolis, Minn.

Other contributors to this contest included: W. J. Northup, agent, D., L. & W., Secaucus, N. J.; A. E. Aumiller, chief clerk to agent, P. R. R., Harrisburg, Pa.; William L. Burt, assistant freight trainmaster, P. R. R., Jersey City, N. J.; William J. Collins, freight agent, D., L. & W., Syracuse, N. Y.; J. C. Goodsell, assistant agent, C., St. P., M. & O., Minneapolis, Minn.; W. F. Hebard, The Buda Company, Chicago; W. H. Gatchell, superintendent of agencies, Southern, Washington, D. C.; Henry A. Goetz, Chicago; Don M. Neiswanger, traveling agent, N. Y., N. H. & H., Boston; D. A. Tomlinson, assistant engineer, C. & W. I., Chicago; M. R. Sutherland, United States civil engineer, Cleveland, Ohio; H. W. Davies, Cent. of Ga., Savannah, Ga.; W. L. Campbell, B. & O., Baltimore; T. Russell, general foreman, I. C., Chicago; J. R. Jackson, assistant engineer tests, A., T. & S. F., Chicago; H. F. Kaho, district agent, M. P., Kansas City, Mo.; J. R. Ness, agent, A., T. & S. F., Wichita, Kan.; J. W. Lawhead, agent, C. R. I. & P., Blue Island, Ill.; J. H. Torney, assistant manager, S. P., New York City; C. I. Heckman, lake freight agent, L. V., New York City; H. M. Gain, trainmaster, G. T., Belleville, Ont.; C. A. Pennington, superintendent of terminals, C., C. & St. L. and C. & O., Louisville, Ky.; H. S. Jaynes, St. Paul, Minn.; Thomas F. Maher, general foreman, M., St. P. & S. S. M., Chicago; S. E. Miller, inspector of transportation, B. & M., Boston; F. G. Schultz, soliciting freight agent, N. Y. C., Pittsburgh; J. Mifflin, freight agent, P. R. R., New York City; Charles W. Brown, assistant superintendent, L. & N. E., South Bethlehem, Pa.; Frank Robinson, general agent, B. & M., Nashua, N. H.; C. H. Brown, agent, N. & W., Columbus, Ohio; F. H. Garner, transportation inspector, U. P., Omaha, Neb.; J. L. Coss, despatcher, C., R. I. & P., Haileyville, Okla.; Leland Wadsworth, agent, Troy, N. Y.; M. S. Wise, assistant to general manager, M. & O., Mobile, Ala., and James P. O'Connor, Great Notch, N. J.

The two prize winning papers are published here and others will follow in early issues.

FIRST PRIZE—HOW THE OPERATION OF ONE LOCAL FREIGHT STATION WAS IMPROVED

By C. B. ANDERSON

Agent, Chicago & Eastern Illinois; Chicago, Ill.

What can be done to increase the capacity of the present freight station? Can this be accomplished without increasing the cost of operation? These questions, paramount in the minds of many local freight agents to-day, have been solved to a large extent by the innovations which have been introduced in the operation of the Chicago freight station of the Chicago & Eastern Illinois.

In different localities somewhat different methods are employed in handling l.c.l. freight, dependent on the facilities, the class of freight handled and local practices. The station layout consists of freight houses or platforms varying in dimensions and served by certain adjacent tracks, which have in most cases been enlarged or extended from time to time in an effort to accommodate the increasing requirements, but, as a result, have become expensive to operate under old methods. In some of the larger terminals, additional space cannot be obtained for de-

velopment, pending a complete rearrangement of the terminals. The future may provide for the double-decking of freight houses to obtain better and greater use of the space occupied, but this is something beyond the agent's control and he must deal with the conditions as they now exist.

The two-wheel hand truck is still the principal tool used, although four-wheel trucks and low dollies are used in some houses for handling certain commodities. At many points those in charge of such terminals have been endeavoring to relieve congestion and increase the efficiency by developing new methods and introducing new tools. The Chicago & Eastern Illinois has made considerable progress along these lines during the last three years; first, by adopting the individual bonus system; and, second, by the use of four-wheel trucks and motors.

An individual bonus system, similar to that in use on the Atchison, Topeka & Santa Fe, was put into effect in October, 1912. Separate schedules were made for checkers, callers, truckers, stowers and delivery men, also for the general foreman and his assistants. To prepare these schedules it was necessary to make a time study of each of the different classes of work performed and obtain accurate information as to the tonnage handled per hour by the different groups in handling the different classes of freight. It is generally conceded that past performances will indicate about 67 per cent efficiency, and from the figures obtained in this study the 100 per cent basis was established. The men are paid a graduated bonus for all work performed above 67 per cent efficiency, and at 90 per cent efficiency are given a bonus equal to 10 per cent of their wages. With each per cent of efficiency over 90 per cent the bonus is increased 1 per cent.

As the outbound house is operated under the no-gang drop-truck system, the schedule for the truckers and motormen is based on pooling all the tonnage handled through that house. All of the other schedules, however, are based on the individual tonnage handled. The schedules for the foremen are based on the efficiency obtained on the work under their supervision. In order to compile the bonus data, additional clerical expense was incurred amounting to \$110 per month, which is charged to the freight handling cost.

Under this plan, our men have increased their earnings 8 per cent to 12 per cent, and in some cases exceptionally good men earn a bonus equal to 25 per cent or 30 per cent of their wages. The increase in efficiency due to this bonus plan has effected a net saving in our cost of at least four cents per ton.

Co-operation is essential to the success of an organization, and any plan that provides for a division of the profits insures that co-operation. In my judgment, the individual bonus plan is an improvement on the pool bonus, in that it recognizes individual effort and places the reward where it belongs. It also enables a foreman to weed out the drones and build up a force of competent men.

It has been our experience that as the men are satisfied, they seldom leave the service voluntarily, and we are not required to train new men constantly. As they become more familiar with our work they are able to perform their duties with more speed and accuracy; consequently, the quality of the work performed has improved rather than deteriorated.

From July, 1912, to June, 1913, various storage-battery motor trucks were experimented with at the outbound freight house in an effort to determine the practicability of using them for freight handling. The truck makers advocated their use as a single unit, loading the freight on the motors at the receiving door and running them into the cars in which the freight was to be unloaded. While it was found that the trucking cost could be reduced more than one-half on the tonnage handled in this way,

two or three power trucks would haul but a small percentage of the total tonnage, as too much time was lost in loading and unloading. It was conceived that better results could be obtained by loading the freight on four-wheel trucks or dollies and using the motors as tractors to move the trucks in trains to the cars. As we had 12 four-wheel trucks and 6 dollies at this time, we equipped them with chains for coupling and continued our investigations along these lines. The results obtained from this system convinced us that this was the practical line on which motor trucks could be developed.

Finally, in June, 1913, we purchased three motor trucks and 36 four-wheel trucks of the "Reynolds" type, equipped with chains for coupling, and set to work in earnest to develop the tractor system of handling freight. Since then we have added to our equipment so that at the present time we have a total of 125 four-wheel trucks and 20 low dollies, and have practically eliminated the use of the two-wheel hand truck in the outbound freight house. Recently we have replaced the chain couplings with automatic couplers, which overcome the delay in coupling and uncoupling, and put a finishing touch to the system. This equipment is handling in the neighborhood of 750 tons of freight per day, which was formerly handled with 300 hand trucks; and 40 less truckers are required to handle the same tonnage. From this it will be readily seen that we have relieved congestion and increased our capacity. Since the installation of motors in our house, two other railroads in Chicago have adopted this tractor system of freight handling and a third road will soon put it in.

I am of the opinion that a large saving can be made in any outbound freight house with the use of four-wheel trucks, even where the trucking distance will not justify the use of the motors. A four-wheel truck occupies practically the same floor space as a loaded two-wheel truck and will carry from three to five times as much tonnage. If a good trucking floor is provided, one man can move as much tonnage with a four-wheel truck as four men with hand trucks, and with less effort. Where the trucking distance is more than 500 ft., I believe a further saving can be accomplished by the use of the motor trucks. Our records show that the four-wheel trucks and motors have enabled us to reduce our trucking cost about 8 cents a ton.

The original cost of the four-wheel trucks, dollies and motor trucks called for an expenditure of approximately \$8,000. The main item of expense for maintenance is for batteries, which, with proper care, should give two or three years' service. A charging panel has been installed in the outbound house and the motor trucks are given a five-hour charge during the night. The cost of current will not exceed \$20 per truck per month. A competent battery man is employed who is also capable of looking after the mechanical features of the motor trucks. His salary is also charged to the freight handling cost.

In order to outline briefly our system of handling outbound freight (which, with the exception of the trucking system, does not differ materially from the methods used by other lines in Chicago) it will be necessary to describe our house and track layout. The house proper is 844 ft. in length with a covered platform extending 890 ft. south, or a total maximum trucking distance of 1,734 ft. The house has a width of 21 ft. inside, with the exception of a distance of about 250 ft., occupied by the tunnel shaft and tracks, where the width is 28 ft. The platform is 20 to 25 ft. in width for a distance of 200 ft., the balance being about 11 ft. wide. Four tracks furnish a spotting of 75 cars adjacent to the house proper, while from one to three tracks located at the platform permit an additional setting of about 50 cars.

Freight is received from teams and tunnel and by car; an average of about 50 carloads of transfer and trap car freight being received daily, which must be unloaded and the cars used for outbound loading. The checkers' booths have been torn out and dial scales placed between two receiving doors. The checker's table is also located in this space, and to eliminate lost motion teams are allowed to back up to both doors at the same time. The checker and his caller, after taking off and checking

one load, immediately turn to the other door and commence to check the second load while the driver of the empty wagon is tying up his ropes and preparing to leave the yard. No delay occurs in handling the second load, by waiting for the teamster to back in and loosen his ropes, as is caused where a single door is operated.

After the freight is weighed and marked by the caller, who chalks the block number on the packages, it is pushed out on the floor to be taken to the designated car by the motors making regular trips through the house. Two men are located on the floor, who sort the trains in set-out order at different points in the house. The loads are set out by the motors and taken into the car by the stower, who is furnished with lists of the stations loading in the four cars under his supervision, and is held responsible for misloading. He is required to check the destination of each package (without regard to chalk marks) as it is placed in the car, and in the event of freight being sent to the wrong car, he notifies the foreman or loading inspector and holds the freight on the platform adjacent to his runway. He also confers with the loading inspector in regard to any freight for points regarding which he is in doubt. On account of the stower's importance under our system, his wages were increased about two years ago from the Chicago rate of 23 cents to 25 cents an hour.

The loading inspector is provided with a loading schedule. He goes among the cars throughout the day, inspecting the loading and instructing the stowmen, and has proved very useful in preventing errors in loading. Another inspector is employed to revise the loading from the shipping tickets. In case he develops that a checker has sent freight to the wrong car, the ticket is sent to the inspector in the house, who arranges to get the freight into the proper car.

Freight from the tunnel is handled very much the same way as that received by team, except that more men are used. The freight is all weighed on portable automatic scales, then marked up and loaded on four-wheel trucks and is sent to the cars.

In handling freight from the cars, a truck loader is used in addition to the caller. Tickets covering mail order business are sorted in alphabetical order according to destination, and the block numbers are put on such tickets before they are turned over to the checkers. This enables them to turn to the tickets and check the item readily as it is called, and the freight is then loaded on four-wheel trucks in peddler loads. It is customary to make several peddler loads to take freight for certain divisions of the house, each package being marked with chalk. This enables the motor to handle the mixed loads to a break-bulk point and from there they are handled by truckers, who distribute the packages at the proper runways. Peddler loads are also made in connection with the door and tunnel freight whenever it is found impracticable to attempt to get straight truck loads.

Our trucking distance has been increased approximately 600 ft. since 1911 on account of additional package cars added to our schedule during this period. We have also assumed several additional items of overhead expense on account of the new system adopted, and an increase in rate given the stowmen, as already stated. Regardless of this, a comparison of the cost of handling practically the same tonnage of l.c.l. outbound freight for June, 1911 and 1915, shows a decrease of 7.8 cents per ton.

OUT-BOUND FREIGHT HOUSE COST

	1911.	1915.
Supervision	\$.018	\$.021
Overhead .....	.053	.071
Receiving clerks.....	.072	.052
Callers .....	.073	.071
Truckers .....	.185	.088
Stowers .....	.085	.105
Total cost per ton.....	\$.486	\$.408

In an exhaustive analysis of hand-trucking prepared by experts about a year ago, it was found that the average trucking cost increased approximately 3 cents a ton with every increase of 100 ft. in the length of the house. Particular attention is, therefore, directed to the remarkable showing made in our trucking cost, which clearly indicates that with the tractor system the trucking distance is material only to a limited extent.

Our inbound house at Chicago is 800 ft. in length and 60 ft. wide, with a covered platform 150 ft. long of the same width, making a total length of 950 ft. This house is served by two tracks with a capacity of 50 cars. The house is divided into three sections, the two end ones being used for city freight and the center section for transfer freight. The freight for city delivery is taken to the nearest city section and the transfer freight unloaded at any point is taken to the center section. This minimizes our trucking on all freight handled.

The unloading force is organized in gangs consisting of a checker, a caller and three truckers. Two-wheel hand trucks are used. Prior to adopting the bonus system, each delivery clerk used a trucker. Since that time the truckers on the delivery side of the house have been dispensed with and the deliverymen now handle the freight. One or two men are furnished to assist in loading pianos and other heavy or bulky freight, when required.

Prior to January, 1913, the blind tally system was used, which required that practically all transfer freight be unloaded in the house and later rechecked and handled to team, tunnel car or railroad car, as the case might be. At that time, we changed to the present system of handling all freight with the freight bills. We do not receive all of the billing ahead of the cars, by any means, but obtain a sufficient quantity to get the men started in the morning and by special effort are able to supply the balance without interfering with the work.

This method enables the checkers unloading cars to dispose of most of the transfer shipments with one handling by sending the freight direct to the teams or tunnel, or to cars marked up for other roads to which we make delivery by car. Only the smaller shipments to be delivered by team are unloaded in the house and they are placed at designated locations in the transfer section by the unloading gangs; freight for each road being kept together for convenience in making delivery. The location of each line in the transfer section is indicated by a wooden sign. With this arrangement in effect, we rehandle less than 50 per cent of our transfer freight, require fewer delivery clerks, relieve congestion and effect more prompt deliveries.

In making a comparison of the cost of handling l.c.l. freight inbound for the months of June, 1911 and 1915, we show a decrease of 8.8 cents per ton, about one-half of which we attribute to increased effort on the part of the men, due to the bonus incentive, and the other half to various changes in system.

IN-BOUND FREIGHT HOUSE COST

	1911.	1915.
Supervision	\$.041	\$.038
Overhead .....	.055	.061
Check clerks .....	.06	.057
Callers .....	.046	.038
Truckers .....	.207	.144
Delivery clerks .....	.104	.087
Total cost per ton.....	\$.513	\$.425

SECOND PRIZE—IMPORTANT PRINCIPLES IN THE HANDLING OF L. C. L. FREIGHT

By C. G. JOHNSON

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The figures used in the compilation of the cost of handling less than carload freight at the larger warehouses of the majority of the railways of the United States are arrived at by so many different methods, both as regards the tonnage handled and the expense of handling, as to make them very unreliable for a comparison of the handling cost per ton at one warehouse with that at another. Car load freight handled through the house by the warehouse force is often included and credit taken on the same basis as for l.c.l., while freight handled at industries and team tracks, moving as l.c.l. and unloaded or loaded by the consignee or shipper, is often included in the tonnage of the warehouse. Credit is sometimes taken twice for freight received, forwarded or transferred and sometimes for all of these divisions, when one handling is all to which they are entitled. The figures covering the tonnage are often obtained

from the monthly abstracts of the waybills, from the daily tonnage report or from the freight received and freight forwarded registers of waybills, all of which are, in a great measure, inaccurate for tonnage statistics.

There are, in my opinion, only three divisions of freight that may be used consistently in computing the cost of the handling of less than carload freight; freight received (covering that freight unloaded from cars for delivery); freight forwarded (covering that freight received at warehouse doors for outbound movement); and freight transferred (covering that freight handled from car to car. One handling of each of these divisions may be used consistently, if we are to establish a reliable cost figure.

The proper method of determining the actual tonnage handled, in, out and transferred, is as follows: For freight received, figures should be taken from the station record of the expense bill, the document used in checking the inbound freight, using only that tonnage covering articles actually checked. For freight forwarded, figures should be taken from the shipping tickets, using tonnage shown thereon as actually checked. For freight transferred, figures should be taken from the transfer record, using tonnage shown thereon as actually checked. This information should be compiled daily.

Although all of the above suggestions may be observed and the cost of handling as shown be slight, it does not necessarily follow that the freight has been handled economically. It may be handled at a low figure, in so far as the initial cost is concerned, but it may have been loaded without regard to intelligent handling; it may have been loaded in the wrong car, or station order may not have been observed; it may not have been trucked or stowed safely, or after it is in the cars it may not have been handled carefully in the switching service, in trains or in the unloading. When we speak of the economical handling of l.c.l. freight we must consider that it must be received, loaded, unloaded and delivered in good condition, or it has lost its economical feature.

In a great measure, the unintelligent handling of l.c.l. freight is due to lack of supervision and a lack of the proper education of check clerks, callers and stowmen as to their duties. It is to be deplored, but it is true, that check clerks, callers and stowmen are generally ignorant of the rules of the classification under which they work, especially as regards the proper marking and packing of freight shipments. There seems to me to be only one remedy, and that is to educate the check clerks along the lines of intelligent handling, pay them well and insist upon their observance of the instructions issued by the railway and the rules of the classification. Agents, as a rule, do not work closely with check clerks, stowmen and callers, but leave the entire handling of the warehouse to the foreman. In my opinion, this is improper. Agents should call the foremen, check clerks, stowmen and delivery clerks into conference at intervals and make them realize that they are an integral part of the organization and that it is within their power to solve the problem of economical freight handling.

THE OUT-BOUND FREIGHT HOUSE

A first-class floor is necessary, maple being preferred. Freight can be handled on a good maple floor approximately 16 per cent faster than on an ordinary rough board floor or on a rough concrete floor. Check clerks should be on their feet near the freight to observe marks and the condition of packages. It is a mistake to provide check clerks with closed booths, as they are not in a position while in these booths to see the freight they are checking, but depend on the caller entirely. Callers being lower salaried employees, should not be depended on to any great extent.

Check clerks should see that sufficient trucks, preferably four-wheel, are provided on the floor near the door. If two-wheel trucks are used, wooden racks should be provided to fit on the shoes of the trucks. The most satisfactory rack is 32 in. high, 24 in. wide at the bottom, 30 in. wide at the top and concave at top. This rack will fit between the handles on the front of

truck as well as on the shoe, and when properly used, will increase the tonnage capacity of the trucks 100 per cent. A strict drop-truck system should be maintained, no freight being allowed to go to the floor, but all loaded on trucks when received.

A line running the entire length of the warehouse on the car side should be painted on the floor, denoting the dead line behind which all loaded trucks should be placed to avoid congestion in the warehouse, leaving a runway open and allowing trucks to be placed conveniently for handling by truckers and stowmen.

Check clerks should be provided with a copy of the current freight classification in order that they may know what freight should be accepted. They should also be provided with an accommodation list, showing all firms entitled to credit, in order to protect prepaid collections on outbound shipments.

Each receiving door should be provided with an automatic scale for the rapid weighing of freight. Weighing of freight is an important factor in the protection of revenue, and as freight is generally received in a rush, rapid weighing is necessary. A door should be reserved for the receipt of small packages in order that the congestion may be relieved at the regular receiving doors.

Each check clerk should be supplied with a caller. When freight is presented, the check clerk should separate the shipping order from the balance of the tickets and enter on it the block or symbol number of the car into which the freight is to be loaded, lining up the shipping orders in alphabetical order as to stations, for convenient checking. What is known as blocking the tickets—that is, placing the symbol number of the car thereon—is sometimes done in the foreman's office of the outbound house, and when it is possible to handle it in this manner it is best, as it places the responsibility on one man. A caller should call the consignee's name and destination and should use the greatest care to see that the calling agrees with the marks upon packages. The check clerk should not depend on the caller, but should be on his feet near the freight, and should closely observe all marks on packages, seeing that all old marks are effaced and that no shipment is received that is improperly marked or packed, or that does not comply in every way with the rules of the classification.

Check clerks should keep an accurate record of freight checked by them and render a report daily to the warehouse foreman covering. Immediately after freight has been checked and the shipping orders blocked with symbol numbers of the car they should be sent to the tonnage clerk for the preparation of tonnage statistics.

All freight should be plainly marked with the symbol number of the car into which it is to be loaded. Truckmen should not be permitted to enter the outbound cars without permission, and then only in cases of emergency, in order that loitering in cars may be eliminated and that the delays caused by the unloading of trucks or waiting for the stowmen may be avoided and that the truck haul may be shortened with only a slight increase in the work of stowmen. Truckmen should move freight from behind the dead line to a point near the door of car runs to which the freight is to be loaded. Trucks should be placed with the shoe near the wall with handles outward, where they will be readily accessible to stowmen.

The number of cars that may be properly stowed by one man depends on the tonnage of the cars and their location on tracks. If all cars are in one run, as high as eleven may be stowed by one man successfully. Stowmen should understand the intelligent stowing of freight, the importance of loading the freight into the proper car, of pulling nails from the sides and floors of cars, and of removing old placards and train cards from cars. They should handle all freight from behind the dead line in the warehouse near the cars, into the cars, stow the freight and return the empty trucks to the opposite side of the warehouse near the receiving doors.

A skeleton loading along the sides and end of car should be observed and freight piled high, temporarily. At the close of the day's loading they should break down all freight in the cars and satisfy themselves that it will ride safely.

When freight is erroneously marked to a car, a report should be made by the stowmen to the foreman in order that the responsibility may be located and action taken to avoid a recurrence. Forms should be provided stowmen for this purpose.

Waybills should be mailed to destination agents in order that they may be expensed prior to the arrival of the freight and the station record of the expense bill used as a checking tally, the cars moving on slip way bills. These bills should be compiled in the foreman's office.

All shipping tickets should be sent from the foreman's office, direct to the waybilling department, and there separated into car order, the symbol numbers being used in the distribution. Waybilling clerks should be furnished with a copy of the daily loading schedule, from which they should obtain the car numbers. The shipping ticket bearing only the symbol number makes it necessary that they use care in the waybilling of car numbers and as a result few errors are made.

Waybill clerks should be prohibited from waybilling any item that does not show as having been checked on the shipping ticket and the ticket should be returned to the warehouse for a verification of the check. All shipping tickets should be completely revised against the waybills as soon as waybilled and a check made on the original waybill. This insures correct way-billing. Waybills should be numbered with a numbering machine and thrown into a distributing case, all waybills covering less than carload freight being distributed under the block or symbol number, and afterward, if covering a way car, in station order for the convenience of the conductor. The waybill pouching clerk should be impressed with the importance of proper pouching, as a waybill incorrectly pouched means that the freight covered thereby will check over at one point and short at another.

As all waybills for one car are distributed together, they should be mailed in that order, to facilitate the expensing at destination. All waybills mailed should be covered by a register and care should be taken to see that they move on the first available train. Envelopes in which waybills are enclosed should be marked with large type, "RUSH—WAYBILLS," in order that the receiving agent may readily separate them from other registered material.

HANDLING THE INBOUND FREIGHT

The inbound cars should be placed at night, if possible, and be ready for unloading at 7 a. m. The house should be subdivided into sections, alphabetically arranged for the handling of miscellaneous shipments. Boards 14 in. by 14 in. in size should be provided for each section, placed in a conspicuous position on posts in the warehouse or on the wall of the house and lettered in large-sized letters. Shipments for large concerns, connecting lines of railways or steamships, transfer companies, hold pile and over pile, should be each allotted a space sufficient to accommodate the ordinary run, and these sections should be indicated by symbol numbers conspicuously placed.

A loose leaf record should be provided for the register of all through waybills covering freight transferred or passing. The expense desk will furnish the house with a station record of expense bills arranged in car order for a checking tally. Check clerks should arrange the station records furnished by the expense desk in alphabetical order as to consignee for each car, using an alphabetical index between the station records for rapid handling.

All freight apparently damaged or recooped should be sent to the hold pile to be handled by the O. S. & D. department, and the disposition should be shown on the station record. The shipment should remain there until a complete inventory is made, and the extent of the damage ascertained, and should not be delivered until released by the O. S. & D. department. Local freight checking over should be run to the over pile and be held there until cleared by the O. S. & D. department for delivery.

Arrival notices should be served by messenger when possible, and by mail otherwise, immediately on the unloading of the freight. Subsequent notices should be issued each week thereafter, and after a second notice, if still unclaimed, the shipper should be notified and asked to furnish disposition. Perishable

shipments that are refused or uncalled for should be sold to the best advantage without delay. Delivery clerks should see that teamsters and other parties receiving freight are not permitted to enter cars or allowed to move freight from the warehouse without their permission.

Storage should be assessed on all shipments remaining in the house over the free time regardless of the fact that bills have been paid, to keep the warehouse clean of freight and to give the consignees first-class service. The waiving of storage charges congests warehouses and cripples the service.

A blind check should be made of the warehouse at least twice a month and the check compared with the expense bills in the cashier's office. This will keep the house free from irregularities, and in many instances effect delivery of shipments that otherwise might remain on hand indefinitely, causing dissatisfaction on the part of the consignee. Street addresses are sometimes left off the expense bills or are not waybilled, although the packages bear the address, and a notice is issued without it. A warehouse check detects these errors. Over freight run to the wrong section is also detected and promptly forwarded to destination.

If a freight warehouse exceeds 600 ft. in length the use of electric trucks for the handling of the outbound business, especially, will save money, provided the trucks are four-wheel and large dollies are used with them, as trailers. One man should be assigned to handle the motor truck and one man to act as a switchman to make couplings, set out the trailers, etc. Where electric trucks, four-wheel trailers and dollies are used, what is known as "peddler" trucks may be successfully loaded and trucked. The longer the truck haul the more economical electric trucks prove. A good motor truck will take five and six fully loaded four-wheel trailer trucks per trip. Sufficient low dollies, especially constructed for the handling of barrel oil, sugar, heavy cases of dry goods, heavy machinery, gasoline engines, etc., should be provided, as these commodities cannot be loaded to advantage on regular four-wheel trucks.

There is now being manufactured a low four-wheel truck that is being used very successfully at a large transfer point recently visited by the writer, in the handling of less than carload freight. All freight is trucked by hand and moved on these trucks, two-wheel trucks being used only for the loading of freight on the four-wheelers, and by the stowmen. At warehouses and transfers where the truck haul is short, freight can be handled by this method at a cost of, approximately, 15 per cent less than by the use of two-wheel trucks fitted with racks. As increased train tonnage decreases the transportation cost per ton-mile, so will the use of four-wheel trucks increase the tonnage of freight handled per truck haul and correspondingly decrease the cost per ton of handling less than carload freight.

There is no more important subject in connection with the handling of less than carload freight than the proper marking and packing of freight shipments, nor is there any greater contributing cause toward loss and damage claims than the failure on the part of railway employees to observe the exceedingly simple rules governing. All employees should be made to realize the fact that a shipment bearing only one marked destination will invariably reach that destination with despatch, while if allowed to move forward bearing two or more marked destinations, it will probably be forwarded to the wrong destination, delayed or possibly lost.

Freight should not be received unless packages are marked in accordance with the rules of the railway and the classification, nor should any package be received that is unfit for transportation. It is an injustice not only to the railways to receive freight improperly marked or packed, but to the shipper and consignee as well.

INVESTIGATION OF IRREGULARITIES

Over, short, or damage reports should be made covering all irregularities, no matter how trivial. Unless the agent at the loading station is advised of the irregularities found against the loading, he will not know of them and will assume that his loading is good. O. S. & D. reports should be investigated by the operating department, and a bureau should be provided for

the exclusive handling of these investigations, either in the superintendent's office of each division, or in the office of the general superintendent of each district. All irregularities should be investigated thoroughly, the responsibility determined, and the proper party charged with the error. A sufficient number of men who are experienced in the handling of less than carload freight should investigate personally the actual handling of the freight and see that rules are complied with, that methods are installed that will increase the efficiency of the service, that the warehouse organizations are efficient and that proper supervision is exercised, not only in the loading and unloading of freight at the warehouses, but in the handling of freight by trainmen.

A bulletin should be issued by the bureau monthly, showing the irregularities charged to the various stations, in order that agents may know just how freight is being handled at their stations. This bulletin should include irregularities chargeable to train crews in order that division superintendents, conductors and trainmasters may take the necessary steps to improve the handling by the crews.

A bonus should be allowed to all classes of warehouse employees for services performed in excess of their regular duties. Employees should be compensated according to their individual efforts. This will act as an incentive to them to put forth their best efforts, in order that they may exceed the work required for the regular wage, and receive the additional compensation. A penalty should be imposed for all irregularities chargeable to the employees. As penalties will reduce the bonus earned, it necessarily follows that employees will endeavor to avoid errors.

THE RAILROADS AND THE PEOPLE*

BY WILLIAM SPROULE
President, Southern Pacific Company

The primary relation of the railroads and the people is that the railroads sell transportation to the people. To many minds this relation disposes of the subject. The common notion is that the people have nothing more to do with it than may be necessary to obtain their transportation at the lowest price. If the buyers of bread had a voice in the fixing of its price, bread would be cheaper, indeed. If the buyers of meat had a voice in the price of meat, it would not be long before the price would drop so low that the farmer would find it without profit to grow livestock. But the people have a voice in the fixing of rates for transportation and the buyer of transportation concerns himself little with the question as to what effect the price has upon the railroads. The price is seldom low enough to satisfy the purchaser. If he is satisfied, his satisfaction with any given transportation rate or rate condition is only temporary. The mere lapse of time suffices to create further demands that the service be rendered for less money. This follows the impulse of self-interest. We all know that this impulse is not always safe or sound.

There is an epigram that in a kingdom of the blind a one-eyed man is king. A hard task before the railroads is on the one hand to correct the impressions which serve for opinions among people blinded by what appears to be their self-interest, and on the other hand to contend against that kind of one-eyed domination of the railroads which keeps one eye upon popular opinion without an eye of vision for what is necessary to bring the greatest good to the greatest number. Yet there is a conjunction of interest which so far has hardly been perceived, but which is sufficient to warrant the railroads and the people in taking counsel together for promotion of the common safety.

THE PUBLIC AS INVESTORS

There are in the United States over 250,000 miles of steam railroad, which have about 600,000 shareholders and about 1,750,000 employees. This figures, roughly, one shareholder to three employees. If you will average the railroad shareholders they will stand within 700 yards of each other along every mile of steam railroad in the nation. This means that throughout the United

*Abstract of an address presented at the Annual Convention of the American Bankers Association, at Seattle, Wash., Sept. 7, 1915.

States each shareholder would be in plain sight of two other shareholders along the right of way. Yet because of the free and easy way in which the public has attached to the railroad properties the names of well-known men, the people generally have a vague belief that the railroads are owned by a very few wealthy people. The facts run to the contrary. The railroads are owned by a great army of the people; people who have put all their savings into railroad shares until 600,000 of them are direct owners. It requires no argument, unless we argue the obvious, to show that if the savings the people have had thus entered into railroad ownership prove to be secure, and the returns to them, as the owners of the money, prove to be attractive, there will be little trouble in obtaining from them and others like them more money for improving the railroads which now serve the people, and for extending them into sections whose development is standing still because of the lack of railroad service. As a question of public policy is it not fundamentally sound that the rights of these hundreds of thousands of saving and prudent people should be given as serious consideration as any other factor in the railroad question? Is it not obvious that there should be accorded to them the same full measure of solicitude which is extended to other human factors prominently before us in all industrial discussions?

But there are still other hundreds of thousands of people who have a personal interest in the railroads. Those whom our political saviors call the common people (why they are called common I do not know) are the chief users of the savings banks of this nation. These savings banks have for their depositors about 11,000,000 of the people. These savings banks carry between eight hundred and nine hundred millions of dollars in railroad bonds and stocks.

It is hardly necessary to refer to state and other banks and trust companies, whose holdings in protection of their depositors and in the conduct of their business count up to several hundred millions of dollars more. This aspect of the subject carries us into still wider fields. Among the large holders of railroad securities the life insurance companies are of vast importance to the people. In the United States there are over 34,000,000 life insurance policies.

THE INTEREST OF THE EMPLOYEES

As already stated, there are over 250,000 miles of steam railroad in the United States, with a roster of about 1,750,000 men. This is a vast army, even in these days of vast armies that affect us with awe. This army of the people relies directly upon the railroads for its livelihood. It has the right to adequate consideration by the government. This consideration it has only in part received.

There has been no recognition of the fact that working hours may be shortened, conditions of labor may be made ideal, safety may be attained, crews may be stuffed full to overflowing and yet the prosperity of this army of people fails simply because the railroads lack the ability to earn enough to keep the men at work, much less to expand, improve and extend the lines and the service. It is to the direct interest of the employees and those dependent directly upon them for their subsistence that the railroads have prosperous earnings.

It is to the further interest of the employees that shareholders also have prosperous returns, for the employees cannot safely forget that, averaged over the American system of railroads, one shareholder means three employees. To maintain and operate the railroads takes not the shareholder alone or the employee alone; it requires them both, and they stand as numbers only in the ratio of three to one. Theirs is in reality a common interest in obtaining adequate earnings.

One blade cannot for long cut into gross earnings without bringing into activity the other blade which cuts expenses. Of expenses over 45 per cent are for wages. In fact, 70 per cent of all the disbursements of the railroads, even when taxes, interest and dividends are included, are for three items of wages, fuel and supplies. The railroads give good wages ungrudgingly. The con-

tentions are rarely upon the wage schedule itself, but upon needless and embarrassing and complicated incidentals. What the railroads have to contend and urge, notwithstanding their desire to pay their employees well, is the plain fact that the railroads have not adequate income out of which to pay these wages. In the two decades from 1894 to 1914 the revenues from operations of the steam railroads increased 183 per cent., but expenses of operation increased 200 per cent. The numbers of employees increased 118 per cent., while the compensation of employees increased 213 per cent. I will state it in another way: with the rates of 1904 as a unit, the railroads would have earned about \$160,000,000 more than the earnings in 1914. While the railroad revenues were thus reduced in the sum of \$160,000,000, the compensation paid to employees was in the same time increased by something over \$100,000,000.

This process cannot keep up indefinitely. As an economic question it is impossible that the compensation of employees can continue to increase while the compensation of employers continues to decline.

So we could move along into the various phases of human activity, only to find that the railroads and the people have interests in common to an extent the people do not yet realize, but when they do realize they will wake up in their might to the fact that the railroads' prosperity is their prosperity. The people will rise to acknowledge that it is the function of the government to be watchful of their interests as a whole, and then the one-eyed man no longer can be king.

They will insist, in the interests of all the people, that the railroads be maintained in a condition of physical and financial strength and that they be released from "the tyranny of prejudice" and relieved from the paralysis of uncertainty. Whether it be the shareholder, the bank depositor, the holder of insurance policies, the railroad employees and their people, or the public generally, all will do well to remember that amid the loose and casual talk about watered stock and over-capitalization it is no longer seriously contended that the railroad properties of the United States are worth less than the amount of their capital. Yet the earning power of the railroads upon the capital employed has so declined that at the present time out of every \$100 of gross earnings which comes into the treasury \$14 has to be set aside to pay interest upon bonds, although the bonds bear but a moderate rate of interest. These bonds were taken up, on faith in the earning power of the properties, and were issued in compliance with the laws of the land. They are held in this country and abroad, and this young and great nation can well see to it that the earning power of its railroad activities is maintained. Especially is this so since it is known throughout the world that the railroads have been under government scrutiny and control for more than a generation. It is true that railroad financial administration may be criticized in spots, and just criticism is wise, but they are like certain dramatic points in a picture; they catch the attention, but they do not tell the story. The people, instead, may be invited to survey the whole history of American railroading, from its pioneer beginnings, through unmapped difficulties and through periods of crisis when great administrators pledged their personal fortunes to save the properties, down to the present moment, and in a wide survey of 50 years it will be acknowledged that as a bank may fail without imperiling the banking system, so the long ordeal through which the American railroads have passed still finds the moral basis of railroad management upon a very high plane in which the American people may take becoming pride.

It is time for the railroads and the people to take counsel together, for the uncertainty which touched the railroads first has reached to the people. This nation needs prosperity more than it needs anything else. No business prospers by repression. The effect and influences of government should be stimulating or they are a failure. The American people prosper together. When we prosper we are all prosperous. The pursuit of life, liberty and happiness has prosperity for its reward, the railroads and the people in conjunction and alike.

Locomotives Ordered in America for Foreign Countries

Engines Built by American Locomotive Co. for Greece, Serbia, Belgium and Russia Have Many Unique Features

The past year has seen an enormous increase in the exports from the United States, brought about by conditions incident to the war in Europe. The railway equipment building industry is one of those affected by these conditions, large foreign orders for both locomotives and cars having been placed from time to time. During the past few months the American Locomotive Company has delivered a total of 177 locomotives on foreign orders, in most of which early delivery was an important factor. It is of interest to note the extent to which American practice has been followed in the design of these locomotives.

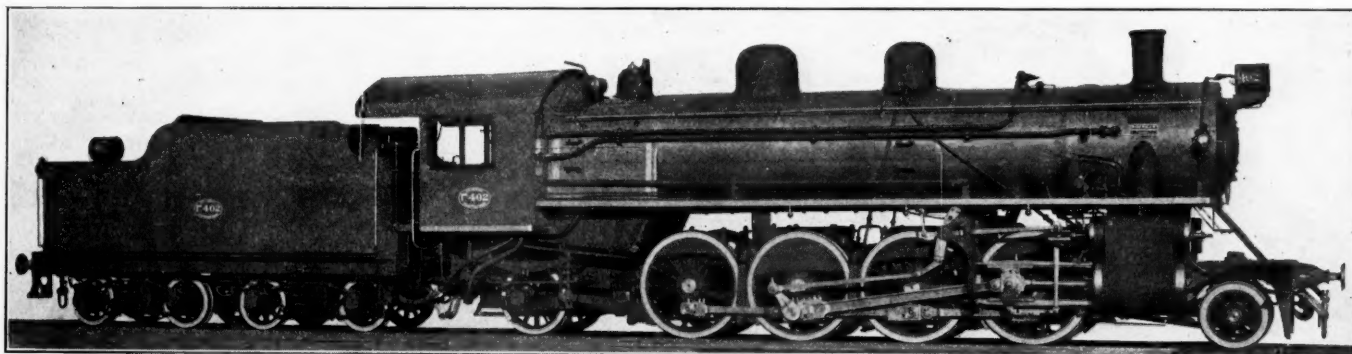
The largest single order was that of the Russian government for 100 locomotives of the 2-10-0 type, which were described and illustrated in the *Railway Age Gazette* for September 10, 1915, page 474. The other orders were for 20 2-8-2 type locomotives for the Greek government railways, 10 locomotives of the 2-6-6-2 and 12 of the 2-8-0 type for the Serbian government, 20 0-6-0 type tank locomotives for the Belgian state railways and 15 locomotives of the 2-6-0 type for the Russian government.

The 2-8-2 type locomotives delivered to the Greek government will be tested on a section of road 43 kilometers (26.72 miles) long, having a gage of 4 ft. 8 11/16 in. Most of the curves are 300 meters (984.3 ft.) radius and for a distance of 2.17 miles the grades vary from .45 per cent to 2 per cent; then for a dis-

458 sq. ft. The grate area is 34.7 sq. ft. While the heating and grate surfaces are smaller than would be considered good practice in this country, they are as large as could be obtained within the imposed limitations of weight, and in comparison with continental locomotives they represent liberal proportions.

Among the details of special interest are the cylinder safety valves, by-pass valves and water gage cocks. The cylinder safety valves are similar to the builder's standard cylinder head relief valve with the exception of the alteration necessary to permit attachment to the ends of the cylinder barrel. Provision was made in the alteration, for the cylinder cock connection, thus avoiding any additional holes in the cylinder barrel. The by-pass valve differs from practice in the United States in that it is operated from the cab by a system of levers. The water gage cocks are designed to close automatically in case the glass breaks.

The design of these locomotives follows American practice with the exception of bolt threads. All outside connections and parts subject to interchange have international threads. Metric threads were used on all bolts, boiler studs and staybolts. The engines are provided with steam heat equipment, electric headlights on both ends, self-centering valve stem guides, the latest Cole trailing trucks, screw reverse gears, Le Chatelaier water brakes, speed recorders and pyrometers. The engines and tenders



Locomotive of the 2-8-2 Type for the Greek Government

tance of 18.64 miles there is a continuous grade of 2 per cent. This is followed by a down grade of 2 per cent about 4 miles long and the remainder of the section is level. A guarantee was given that the locomotives would haul over this line a train of 250 metric tons (275.6 short tons) back of the tender at a speed of 25 kilometers (15.53 miles) per hour on the continuous 2 per cent grade and at 60 kilometers (37.28 miles) per hour on the level, or a train of 190 metric tons (209.5 short tons) back of the tender at 40 kilometers (24.86 miles) per hour on the 2 per cent grade and at least 80 kilometers (49.71 miles) per hour on the level. Having a specified axle weight limit of 15 metric tons (33,080 lb.), these engines, with a weight on drivers of 131,800 lb. and a total weight of 187,500 lb., are as large as it was possible to build. With 23-in. by 26-in. cylinders, a boiler pressure of 170 lb. and 60-in. drivers, they have a tractive effort of 33,200 lb.

The boiler is of the straight top radial stay type. It is 61 in. inside diameter at the front end and is fitted with 134 2-in. tubes, 19 ft. long, a 21-unit Schmidt superheater and a brick arch supported on tubes. The firebox is of copper and is 83 3/4 in. long by 59 3/4 in. wide. The tubes are steel, but have copper ends 6 in. long at the firebox end and all water-space stays are copper, with tell-tale holes drilled in both ends. There is a total evaporating heating surface of 2,031 sq. ft., of which 1,881 sq. ft. is in the tubes and flues, and a superheater heating surface of

are equipped with vacuum automatic brakes, which are now in use on the Greek roads. The use of air brakes is contemplated and the engines are arranged so that they may be applied with the least possible trouble.

On February 9 an order was received from the Serbian government for 10 2-6-6-2 Mallet locomotives of new design. All drawing room work was done in 19 working days; the first engine had been designed, built, tested, knocked down and shipped on April 8.

These 10 Mallets and the 12 Consolidation locomotives have outside frames, which were necessitated by a gage of only 30 in. As many details as possible were made interchangeable between the two classes. The Mallet engines have a total weight of 126,000 lb. and cylinders 13 in. and 20 1/2 in. in diameter by 20 in. stroke. The driving wheels are 36 in. in diameter and boiler pressure is 200 lb. They are fitted with the builder's system of compounding and have a tractive effort working compound of 24,300 lb. Working simple the tractive effort is 29,200 lb. The boiler is of the straight top type, 52 in. in diameter at the front end and has 157 2-in. tubes, 15 ft. 1 1/2 in. in length. By means of a brick wall, a grate 85 in. long by 39 1/4 in. wide is installed in a firebox 114 1/8 in. long by 39 1/4 in. wide.

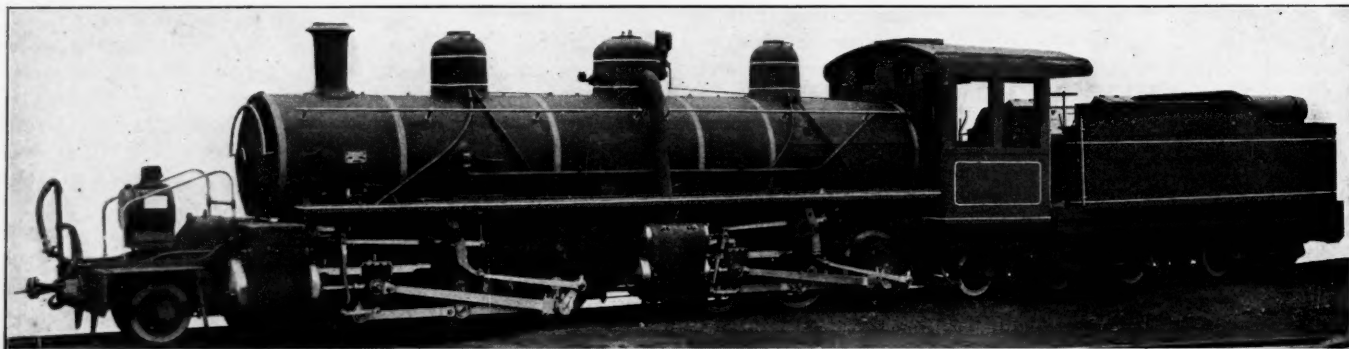
An order for seven Consolidation engines was received from the Serbian government on January 12, which was increased to 12 on January 28. Five of the engines were shipped on March

11 and the remaining seven on March 18. The Consolidation locomotives have a total weight of 80,500 lb., cylinders 15 in. in diameter by 20-in. stroke, carry a steam pressure of 160 lb. and have a tractive effort of 17,000 lb. The boiler is of the straight top type, 47 $\frac{7}{8}$ in. in diameter at the front end and is fitted with 126 2-in. tubes 15 ft. 1 $\frac{1}{2}$ in. in length; the firebox is 48 3/16 in. long by 39 $\frac{1}{4}$ in. wide. The builder's standard methods of construction were followed in these engines throughout.

In Belgium the use of overhead trolley wires is prohibited and, although electric traction is used in the cities, all interurban

sheets extend from the bottom of the frames to the bottom of the side tanks. Five swinging doors on each side allow access to the moving parts. The engines are arranged for operation from either end. The throttle and reverse lever handles are fitted with steel links which hold the latch levers open when the engine is being operated from the opposite end. A hand-operated automobile horn is installed on each end.

Early delivery being an important consideration in the order for 100 locomotives of the 2-10-0 type for the Russian government, it is of interest to note the time spent in the design and

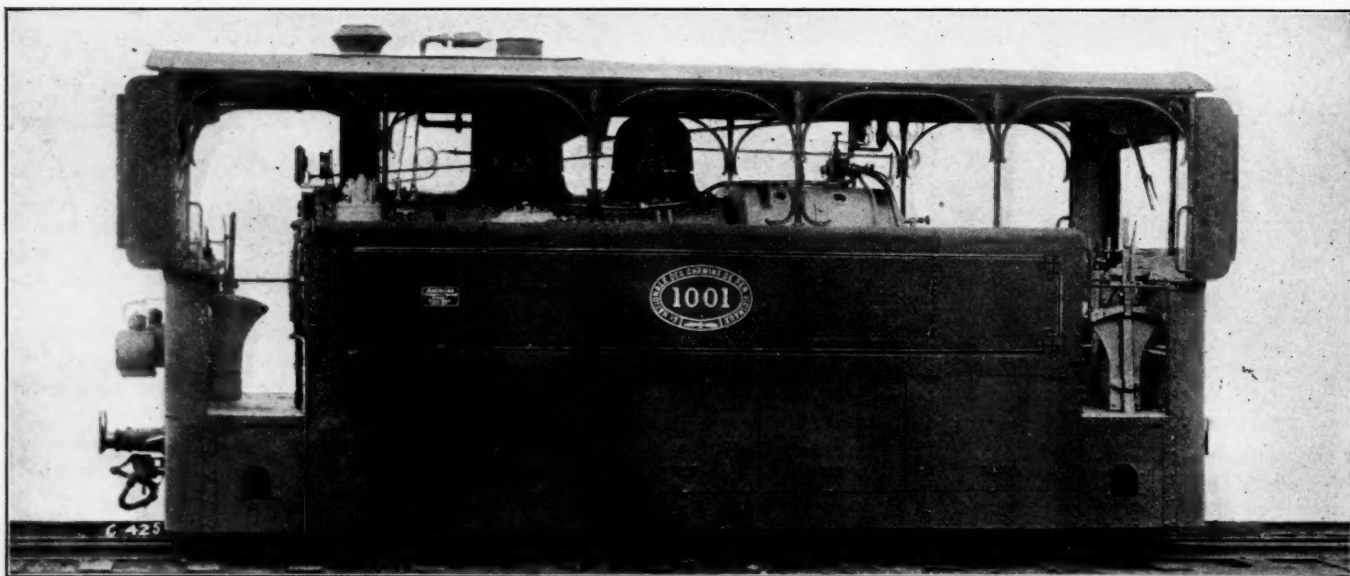


Narrow-Gage Mallet Locomotive with Outside Frames for the Serbian Government

traffic is handled by small steam locomotives of unique design. These engines haul passengers and produce to the distributing centers in the large cities, the tracks connecting with the electric lines. An order for 20 tank locomotives for this purpose was placed by the Belgian state railways on June 2, the first engine being shipped on August 19. The gage of the track on which they operate is 39 $\frac{3}{8}$ in. and the total weight in running order is 58,900 lb. Having cylinders 11 $\frac{1}{2}$ in. in diameter by 16 in.-stroke, driving wheels 34 in. in diameter and a steam pressure of 180 lb., they have a tractive effort of 9,520 lb. The boiler is of the Belpaire type, 42 in. in diameter at the front end, and is designed to burn coal briquettes. It is fitted with 144 tubes 1 $\frac{1}{2}$ in. in

construction of these engines. Drawing room work was started on June 19. The design was an entirely new one and was completed and the material ordered by July 15. The first locomotive had been built, tested under its own steam, knocked down, boxed and shipped by August 18.

The cylinders of these engines are provided with by-pass valves, a unique feature of which is an arrangement whereby they are controlled by superheater damper cylinder. Ordinarily the damper cylinder receives steam from the steam pipe and therefore does not operate until a short time after the throttle has opened. But the by-pass valves must close immediately when the throttle is opened. This necessitated changing the



Double-End Narrow-Gage Locomotive for the Belgian State Railways

diameter and 6 ft. 4 in. long. The firebox is 42 in. long by 28 $\frac{1}{4}$ in. wide and is designed to drop down between the frames for repairs. Ten engines have steel tubes and steel fireboxes and the other 10 have brass tubes, copper fireboxes and copper staybolts.

As the soil is of a very sandy nature, all running gear is enclosed to exclude dust. Having outside frames, the enclosing

steam connection for the damper cylinder from the cylinder steam pipe to the turret, with an intervening control valve connected to the throttle. By this change steam is instantaneously admitted to the damper cylinder when the throttle is opened and the by-pass valves are immediately closed. In a similar way the by-pass valves are immediately opened when the throttle is closed.

On July 2 the Russian government ordered 15 2-6-0 type locomotives for the Peter and Great Fortress Revel. This was an entirely new design, American practice being followed, and the first engine was shipped on September 10. These engines are built for 750-m.m. (29.53-in.) gage track and weigh but 37,265 lb. in working order. The cylinders are 11 in. by 16 in., the boilers carry 165 lb. pressure and, with wheels 33½ in. in diameter, the tractive effort is 8,100 lb. The boiler is of the straight top type and has 504 sq. ft. of heating surface. Soft coal is burned on a grate of 9.3 sq. ft. area. The tender is of the four-wheel rigid pedestal type and has a water capacity of 700 gal. and carries 1½ tons of coal.

REPORT OF COMMITTEE ON RELATIONS BETWEEN RAILROADS

The report of the Committee on Relations between Railroads, presented at the meeting of the American Railway Association, held in Chicago on November 17, was briefly referred to in our account of the meeting published in the issue of November 19. We are now able to present more fully some of the more important features of the report, together with the action taken by the association on some of the committee's recommendations.

LOSS AND DAMAGE TO FREIGHT

The report of the Sub-Committee on Packing, Marking and Handling of Freight, showing a reduction of about 22 per cent, or over \$3,500,000, in loss and damage payments during the first six months of 1915, as compared to a similar period in 1914, by 99 roads, was mentioned in last week's issue. As the operating revenues for this period indicate a smaller percentage of decrease, not only is an absolute saving indicated, but also a saving as compared with the freight revenue. It would appear from these figures that the railroads have checked the tide in payments for loss and damage which has been rising rapidly since the fiscal year 1909, and it is hoped that next spring a further reduction will be shown. It should be noted, the committee says, that these savings took place in a period when the railroads had secured very nearly uniform instructions for packing and marking, when an improved inspection of shipments had been generally inaugurated through individual railroads and inspection bureaus, when more railroads than ever before had organized departments to supervise loss and damage, and when general interest in this important subject had been spread more widely than ever before. It is the belief of members of the committee that the shippers are assisting by giving more care to the preparation of goods for shipment. The committee believes that these economies will be continued, but this can only be secured by strict enforcement of the rules.

The committee reported that the code of l.c.l. rules approved by the association a year ago has been endorsed by the Freight Claim Association and the American Association of Freight Agents, and has been adopted by a very considerable number of railroads. As a new edition is necessary, a number of changes proposed by the committee were adopted. The committee believes that its adoption and enforcement by any railroad will inevitably result in economy in the matter of loss and damage. The report also stated that a number of members have materially reduced their claims for loss and damage by introducing what is termed an affirmative check or double check system in loading their cars with l.c.l. freight.

The committee stated that the point has been made that some of the systems mentioned are not, strictly speaking, affirmative or double-check systems. While the committee recognizes that this may be the case, these systems have had good results on the roads that have adopted them, and the committee thought it best to print them, as well as the others, without specific recommendations in regard to any of the systems, but in the hope that the railroads generally will experiment with them and give the committee their suggestions. It is hoped that with further experience in this important matter it may be possible for the com-

mittee to recommend for adoption one system for checking l.c.l. freight into cars. The description given by the committee is as follows:

DOUBLE-CHECK SYSTEMS FOR LOADING L. C. L. FREIGHT

The object of a double-check system is to establish an affirmative loading record which will show conclusively each step in the handling of freight from the time it is received until deposited in the proper car, and that all packages are in safe condition for transportation, properly marked and carefully stowed.

I

At way stations all freight received should be carefully checked against shipping order, this check to include inspection for classification, weight, packing and marking, and should also be in accordance with the code of L. C. L. Rules, as approved by the American Railway Association. Waybill should be prepared leaving car number blank, and freight then moved to loading platform, where, upon arrival of the local freight train, it must be stowed under the supervision of the agent and the local conductor, who will check each piece of freight against the waybill and see that the correct car number is inserted. The agent should also insert car number on shipping order or on office copy of waybill.

II

At stations where only a few cars are loaded daily the responsibility for proper loading and stowing rests entirely with the agent. Cars placed for loading at these stations must be inspected as prescribed in the "Rules for the Inspection and Certification of Box Cars, Before Loading with Freight Subject to Damage," as approved by the American Railway Association. The best results can be obtained where two or three men are employed if one checks the freight on receipt against the shipping order and another checks the freight into the car against the waybill or shipping order. If waybill is used for checking, loading record will be inserted in office copy.

III

At large stations it may be possible to adopt one of the several systems hereinafter described without any additional cost and frequently by rearrangement of the warehouse force, which will result in a reduction in the cost of handling freight. Any of these plans may be used regardless of whether the freight house force is employed on a tonnage, bonus or daily pay basis.

All cars placed for loading l.c.l. freight must be inspected as prescribed by the "Rules for the Inspection and Certification of Box Cars, Before Loading with Freight Subject to Damage," as approved by the American Railway Association.

Each car is given a loading number. Cars bearing the same loading numbers are placed in the same position each day, when practicable.

Each package is checked against the shipping order when received.

A double check can be obtained by having receiving clerks stationed at warehouse doors check freight into the warehouse from the dray onto the truck, and a stowman or loading clerk, located at the car, check from the truck into the car.

The double-check systems in use may be described as follows:

(a) The loading number is indorsed upon the shipping order. After freight is loaded on the truck, the loading number of the car is marked on the top package and the shipping order is sent with the truck to the car, where a re-checker checks each package into the car, tallying it on the shipping order.

(b) The loading number is indorsed upon the shipping order and is marked on each package. The trucker takes the load to the car designated by the number on the top package. The shipping order is sent direct to the office. An assistant foreman inspects each package after it is actually in the car and puts a distinguishing check mark thereon before it is stowed.

(c) Receiving clerks are furnished with a supply of consecutively numbered ballots. When freight is received serial number of the ballot is shown on the shipping order and the loading number of the car marked on the ballot, which is handed

to the trucker, who takes freight to the car designated. In each car there is a supply of ballots bearing the loading number. The trucker returns both ballots for verification. Ballots are checked against the shipping orders to ascertain if freight was sent to the right car.

(d) Each shipping order is given a consecutive number as received. The loading number is indorsed on the shipping order and marked on the top package of the truck, except in cases where the truck carries freight for more than one car, when each package should be marked. Receiving clerks are furnished with a supply of ballots provided with space for loading number, number of pieces, consecutive number on shipping order, check clerk's initials and the date. This ballot is sent with the truck to the car. Stowman removes ballot and checks the number of pieces and loading number. After the freight is stowed, ballot is checked against the billing and filed.

IV

At transfer stations each car is given a loading number and placed in the same position each day when practicable.

(a) Waybills are abstracted as received with destinations in alphabetical order. Consecutively numbered ballots with stub attached bearing the same number are furnished check clerks. As freight is brought from car being transferred, ballot is given to the trucker showing the loading number of the car into which freight is to be loaded and the same information is also shown on the stub, with letter designating the trucker who deposits ballot in the car. Stubs are examined frequently to see that freight is in the right car. Stubs of the ballots are checked against the abstract sheet, which also shows loading number of the car into which freight is to be loaded and consecutive number of the ballots.

(b) With each truckload of freight the trucker is given a ballot which shows the loading number of the car. When freight is deposited in the car a ballot is taken therefrom which bears the loading number and also the initials and number of the car. Both ballots are returned and an indorsement is made upon the billing showing the initials and number of the car into which the freight was loaded. Waybills are then examined to see if freight was loaded into the proper car.

(c) The loading number is marked on waybills covering cars to be transferred and in the space provided for is shown the initials and the number of the car into which freight is to be loaded. Each waybill is given a Veri-check number. If more than one shipment is on the same waybill, each consignment is numbered. With each truckload of freight the trucker is given a Veri-check slip on which is shown the loading number, check clerk's initials, Veri-check number and number of pieces on the truck. This is deposited in the car and checked throughout the day to see that the freight is properly loaded. When loading is completed the Veri-check slips are checked against the waybills.

VARIOUS RECOMMENDATIONS

The committee also recommended a number of amendments in the rules governing methods for loading carload shipments of flour, and a code of rules governing methods for handling carload shipments of cement and plaster, which were adopted by the association. The committee also recommended a resolution, which was adopted, that at large flour loading centers cars furnished to mills should be inspected by a joint representative for all lines, and a certificate of inspection be attached to each car, to be filed by the agent at loading points for future reference.

The committee is still urging upon the American Association of Accounting Officers the advantages of through interline billing and is furnishing that association with cases where loss and damage has resulted from errors in rebilling. This matter is also under consideration by the Southeastern Freight Association. The committee has made a number of recommendations for the various classification committees, tending to the improvement of containers, and especially to the strapping or sealing of boxes of boots and shoes, dry goods and other high-class commodities especially subject to pilfering. Representa-

tives of the committee have attended recent hearings of the classifications committees, and will be represented at all subsequent hearings which involve questions of marking or packing freight.

The committee is considering, among other subjects, the following questions: Sealing of freight cars, robbery of cars without breaking seals, loading rules for carloads of various commodities, packing and loading of news print paper, containers and loading of palm oil, coconut oil, linseed oil, etc., pulpboard and fibreboard containers, packing of l.c.l. stoves, elimination of the "one in ten" marking rule, and loss of gas tubes and other metal containers.

WEIGHING

The report of the Committee on Weighing, announcing arrangements for the free testing of railway master scales by the government scale testing equipment, was noted in the report published in last week's issue. The committee reported that the railways are confronted with a new difficulty in the matter of weighing. The industries of the country, as represented by the Committee on Weighing of the National Industrial Traffic League, are taking the position that the marked tares on railway freight cars are generally inaccurate, and are making this a basis for claiming that every shipper shall have the right to require railways to light-weigh every freight car, before it is loaded, free of charge. The committee does not believe that the expense of such an arrangement is justified, but stated that to prove this it will be necessary for the railways to take still further action in promptly re-weighing and re-marking their own cars, as well as foreign cars upon their lines. The Master Car Builders' Association has increased the fee for re-light-weighing and re-marking of foreign freight cars, but the amount provided does not appear to be sufficient to pay the per diem on the foreign car while it is being held out of service. The committee, therefore, recommended the adoption of a new per diem rule, providing for a two-days' reclaim on freight cars which are re-light-weighed and re-marked.

The National Code of Weighing Rules applying to carload freight has been generally adopted by all roads west of the Alleghenies. The adoption by eastern roads has been postponed, pending the result of negotiations regarding certain questions involving the weighing of empty cars for shippers and consignees. The need of a set of rules for the weighing of l.c.l. freight is apparent, the committee says, and it has formulated a set of l.c.l. weighing rules which is being considered by the National Industrial Traffic League. The proposed code was approved. On the recommendation of the committee a request was made upon the Association of American Railway Accounting Officers for some slight changes in billing forms to facilitate the giving of the necessary information as to weighing.

CAR SERVICE

On the recommendation of the Association of Transportation and Car Accounting Officers a revision of Form H, summary of per diem and passenger car mileage, and Rules 13 and 14 of the code of per diem rules were approved. Amendments were also approved in per diem Rules 15, 19 and 20, eliminating all reference to the transmission of embargo notices, to provide that the Commission on Car Service enforce the observance of car service Rules 1 to 4 on the complaint of any party, and to provide a two-days' reclaim against the owning road on freight cars which are re-weighed and re-marked. A new form T, on which cars held for delivery may be properly reported; in accordance with per diem Rule 14, was adopted.

The committee has taken part in the meetings of the Committee on Movement of Empty Freight Cars, and in its opinion the most fruitful cause for unnecessary empty mileage has been the practice of returning foreign cars empty and loading home cars in the same direction. To remove this cause the committee recommended changes in car service Rules 2 and 3, which were adopted. Car service Rule 2 authorizes the loading of foreign cars "in the direction of the home road." This expression has never been defined, and under the proposed changes, to deter-

mine the direction of the home road, the continent is divided into 17 groups, which are numbered, as shown on a map accompanying the report. The group number of the point at which the car is standing should be first ascertained on the map, and the group number or numbers of the home road should then be ascertained from an alphabetical list compiled for this purpose. When the number of the group in which the car is standing is ascertained the groups which are in the direction of the home road may be found on a chart prepared for this purpose, in the intersecting square to the right of the location of the car and below the home group.

The committee concurs with the Committee on Movement of Empty Cars in recommending a thorough enforcement of the home route card system, as indicated in car service Rules 5 and 19, and attention was called to the fact that this system was made obligatory upon all subscribers to the per diem rules agreement after December 31, 1915. The effective date for the use of the continuous home route card was postponed until July 1, 1916.

On the recommendation of the committee interpretations of car service Rules 16 and 18 were adopted.

DEMURRAGE

In view of the amendments to the car demurrage rules which have recently gone into effect the committee did not recommend any changes in the rules. The committee stated that one cause of delay to box cars has been that it has not usually been practicable to charge demurrage on cars loaded with export grain consigned to elevators located at the seaboard. The committee has represented to the traffic associations that the greatest congestions have occurred when the export elevators are filled with grain, and it is therefore impossible to unload the cars consigned to them. The point has further been made that this situation would be improved if the storage rates applicable to grain in the elevators should also apply to the grain in cars which cannot be unloaded into the elevators. The traffic associations have taken up this suggestion and the committee had hoped that the arrangement could go into effect on December 1 at all Atlantic and Gulf ports. The chairman reported, however, that he regretted that the hope had not been well founded.

The committee has received reports showing extreme delays to cars loaded with automobiles, and has represented to the National Industrial Traffic League and to the automobile trade generally, the necessity of an increased rate on certain cars similar to the increased rate recently approved for refrigerator cars, which has had such a good effect. The committee has been unable to convince the trade that an increase in the demurrage rate is necessary, but the automobile manufacturers are using all the influence they can to secure prompt unloading. The committee is continuing the collection of information, and if the efforts of the manufacturers to secure prompt unloading of cars are ineffective, the committee will again press the question of an increased rate.

Changes in the definitions and in Rule 2 of the code of switching reclaim rules were adopted. An amendment was also approved in storage Rule 4, and it was decided that the storage rule should not apply on tank cars of crude petroleum during process of loading in or on railroad premises between October 1 and March 31, inclusive, when the cars are loaded north of parallel 35.

A form of rubber stamps to be used in connection with claim papers forwarded by railroad business mail was adopted on the recommendation of the committee.

SIAM-FEDERATED MALAY STATES RAILWAYS.—With regard to the proposed linking-up of the Siamese Southern Railway with the Federated Malay States system, it is stated that a point at Kampong Rantan Panjang has been fixed up as the place at which the two systems will be connected, the new survey of the Siamese line to the Kelantan boundary having been completed, while the Federated Malay States Railways Administration has completed its line to the Golok River, the frontier between Siam and Kelantan.

FRENCH RAILWAY ACCIDENTS IN WAR-TIME

BY WALTER S. HIATT
Our Special European Correspondent

While no statistics are yet available to give a comparison of the number of passenger train accidents in time of war and peace, it is certain that the French railways have until the present been remarkably free from accidents involving fatalities to passengers.

But two accidents of importance from the French point of view, and in France railway accidents are closely watched by the public, have occurred during the past eight months. One of these was that at Rochefort on the State Railway Lines, May 17 last, when seven employees were injured, and the other that at Saint-Cyr-de-Favieres, October 9, on the line of the Paris-Lyon-Mediterranee, when 17 soldiers were killed and more than 30 injured.

Although death is an everyday affair now, with thousands of men killed or wounded each day at the front, both of these accidents were widely recorded in the newspapers, and this goes to show how seriously a railway accident is regarded in France.

The accident in May consisted of the derailment of the Nantes-Bordeaux express in the early hours of the morning. The investigation held concerning it developed the fact that a steamship smokestack, improperly loaded, had dropped off a freight train preceding the express and remained on the track. The locomotive and tender of the express train were derailed while the baggage and mail cars were telescoped. The seven employees in these two cars were injured. The passengers in the other cars escaped with a bad shaking up.

The second accident referred to resulted in the largest number of fatalities of any accident that has taken place in France for many years. It occurred at 6:50 a. m., October 10. The train was a special, loaded with soldiers on leave from the front. Just after the train left Saint-Cyr-de-Favieres, a way station below Lyons in the south of France, it broke in two on an up-grade and six passenger coaches running wild returned to the station which the train had just left and there jumped the track and rolled into a ravine. Only a dozen of the soldiers in the six cars were able to continue their journey. The rest were taken to hospitals in Saint-Etienne and Roanne. The investigation into the accident has not yet determined whether it was due primarily to an old and worn coupling or to improper handling of the train by the engineer.

The whole subject of railway accidents has in past years interested France as much as it has the United States and according to carefully compiled statistics in normal years there is but one passenger killed to 32,000,000 carried, and but one injured to 1,300,000 carried.

The growing safety of railroad travel was strikingly pointed out by M. Sartiaux, in the *Annales des Ponts et Chaussées*, who showed that between the years 1835 and 1875, a period of 40 years, 1,781,403,687 passengers were carried in France and that of this number one was killed to 5,178,490 carried and one injured to 580,450 carried. In the 40-year period since 1875 railroad travel has tripled in safety.

M. Sartiaux developed the curious fact that stage-coach travel of olden times was far more dangerous, one passenger being killed to 335,000 carried and one injured to 50,000 carried.

There is no doubt, however, that during this year while the war is on, the number of fatalities in other than train accidents and not to passengers, but to soldiers acting as track guards, will be strikingly large. Every railway station and mile of track is now under guard, day and night, and these soldier guards, not being railroad men, have yet to learn to protect themselves from passing trains. The accidents to soldiers have been particularly frequent at night and about guarded tunnels.

Otherwise, owing to the careful manner in which railway stations and tracks all over France are fenced in and the highway grade crossings are protected by gates, there are rarely any fatalities to trespassers or to persons not actually on board trains.

Passenger train accidents are generally due to derailments and the proportion of passenger train accidents to freight accidents is as one to 12. Thus, in an average of 12 derailments there are eight of road freight trains, one of passenger trains and three derailments in freight yard trains.

Taking an average of 20 derailments, two are caused by track conditions, seven by defective car or locomotive material, nine by the lack of care of trainmen and two by unknown causes.

The most prolific season for train accidents in France is the autumn. Thus, of eight derailments, three occur then, in part because of fogs, rain and colder weather; two occur in the spring, two in winter and one in summer.

RAILROAD BROTHERHOODS BUSY

By W. L. STODDARD

WASHINGTON, D. C., November 24.

The railroad brotherhoods have a new and possibly a powerful ally in Washington in the Industrial Relations Committee, which has just opened its offices here. This committee, as has been announced in the daily press, is a lineal descendant of the U. S. Commission on Industrial Relations, whose existence automatically terminated by law in August. The chairman of the commission, Frank Walsh, becomes chairman of the committee; the three labor members of the commission remain with Walsh, and to this group are added eight others, six men and two women, all more or less well known as sympathetic with the program and purposes of labor. Of particular significance to the readers of this correspondence is the fact that one of the three labor members of the committee is Austin B. Garrettson, president of the Order of Railway Conductors.

Basil M. Manly and George P. West, Mr. Walsh's most active lieutenants on the commission, have charge of the Washington office of the committee. The following paragraphs are based, in part, upon a talk with these gentlemen:

Exactly what the Industrial Relations Committee can do is, very naturally, an open question at this time. Judging, however, by its intentions it has an active, if brief, future before it. The general plan is to agitate, lobby and work for the recommendations of the Manly report to the Commission on Industrial Relations, and to serve labor, organized and unorganized, as a kind of field campaign staff. Back of the committee is the support of the most powerful unions in the country. The American Federation of Labor has offered its sympathy and co-operation; the United Mine Workers are understood to have subscribed to its war chest; the industrial unionists and their friends are looking to the committee for help; and many unattached "radicals" and labor people see in it a tool or weapon to be used in the various movements in which they are involved.

At its hearings in Chicago the Industrial Relations Commission collected a large mass of testimony on craft organization and industrial organization. In its files also is said to be testimony, admirable at least for the purposes of agitation, bearing on the attitude of railroads toward labor, railroad police, the use of arms in railroad strikes, and so forth. This material the committee apparently plans to utilize whenever it sees fit. The personnel of the committee as a whole probably endorses the industrial union idea, as against the plan of craft organization, and a clever use of what has been gathered on this subject would unquestionably tend to stimulate discussion and action.

In the Manly report of the Industrial Relations Commission it was recommended that Congress prohibit tipping of employees of public service corporations engaged in interstate commerce; that employees engaged in the Pullman service be included in the hours of service law; that the Public Health Service should devise a code of sanitary regulations for railroad construction camps; that Congress should prohibit railroads from inducing their employees to sign releases of liability for accidents; that Congress should prohibit the railroads from requiring employees to contribute to benefit funds and allow them to participate in

the management of all benefit funds and other funds; that the employment of private police on railroads should be regulated by federal statute; and that the states should assume full responsibility for protecting railroad property and preventing trespass. In addition, both the Manly report and the so-called Commons report recommended that the Newlands act be extended in several directions.

These legislative recommendations the Industrial Committee declares that it will urge upon Congress by every means in its power. This means that bills will be introduced, possibly in both chambers, by sympathetic senators and representatives; that hearings will be demanded and perhaps granted; that agitation along new lines for new labor legislation will be started, with all that this entails. Publicity was the keynote of the now extinct commission. Publicity will be the keynote of the new committee, and such publicity as can be turned out on the questions at issue are certain to complicate an already complex situation. If this lobby actually proves to be a fraction as efficient as its predecessor, overburdened statesmen may well groan under the new loads placed on their shoulders through its agency.

In this connection the recently announced movement of the four railroad brotherhoods looking toward demanding an eight-hour day is interesting thoughtful men in Washington profoundly. Members of Congress and government officials unite in regarding this as one of the most significant and serious announcements in the railroad world for many months. The firemen and engineers of the southern associations met here early this week in order to discuss this matter in its various phases. This concerted movement of the four organizations is apparently in line with the tendency of labor, railroad and non-railroad, to get together for its own ends and to secure help and assistance by co-operating with other elements bound in the same general direction—elements well represented by the Industrial Committee.

* * * * *

The Labor Gazette presents this month comparative figures on unemployment on railroads, drawn from the annual reports of the various railways filed with the Interstate Commerce Commission:

"For 55 leading transportation systems which up to the close of October had submitted their reports, it was found that 12 per cent more were employed in 1914 than in 1915, and that 10 per cent more was paid in wages by these companies in 1915 than in 1914. The comparative totals for the 55 railroads considered as one system are as follows:

	Railroads		Increase over 1915
	1914	1915	
Number of employees.....	278,248	245,209	33,039
Total compensation.....	\$220,605,085	\$198,633,390	\$21,971,695

"The 55 railroads, as can be seen above, employed 33,039 more men, and paid \$21,971,695 more in wages in 1914 than in 1915."

THE URUGUAYAN RAILWAYS.—The operating details given by the general manager of the Central Uruguay Railway of Monte Video in the report for the year ending June 30 last show that the management did its best to cope with the very unfavorable situation created by the European war, coming on the top of a commercial crisis in the Uruguayan republic. With the decrease of 14.18 per cent in the gross earnings of the "combined system" it was possible to reduce the train-mileage by 16 per cent, but owing to the exceptionally heavy traffic the car mileage was only 6.08 per cent less than in the preceding year. The average number of cars per train was 24.37 as against 21.80, an increase of 2.57, due to the return to a mixed train service, and to the heavy cattle traffic which is always hauled in complete train loads. There was an increase in receipts per train-mile. Working expenses were reduced by 9.64 per cent, all expenditure being reduced to a minimum.

The Country's Railroads and National Defense*

The Use Made of Our Railways in the Civil and Spanish Wars and a Discussion of What Should Be Done Today

BY GEORGE D. SNYDER

Deputy Chief Engineer, Hudson & Manhattan

Military men were somewhat slow to realize the great use that could be made of railroads and the influence they would have on their campaigns, until our Civil War. The tremendous use of railroads in that conflict demonstrated what a great assistance they were to armies, and since then all nations make great use of railways in their war plans. Germany studied the railroad problem prior to the Franco-German war, and in that conflict made extensive use of the railways in mobilizing and concentrating its troops. The French, not having sufficiently studied the problem and not contemplating the loss of Paris, were seriously handicapped. The railroad system, being built to accommodate civil commerce only, radiated from Paris to the provinces, and, when Paris was invested, many of the provinces not occupied by the Germans were cut off from each other, as the only transfer junctions were in this beleaguered city. Since then, to obviate this difficulty, France has built numerous connecting links to join these radiating lines outside of Paris.

Most European nations have a staff of officers studying the railroad problems in time of peace, who are prepared to take over and operate the railroads for military purposes in time of war. These nations also have bodies of troops trained as railway construction corps, for use in construction, repair and maintenance of railroads in the zone of military activity. As these nations mostly have state-owned railways, the training of the officers and troops in time of peace can be readily arranged.

It would seem that the United States is behindhand in this matter, as the only officers of the army who have relations with the railroads in time of peace are those of the quartermaster's department, who arrange for army transportation, but these relations are purely on a commercial basis, and our army has no corps of officers skilled in railroad operation, maintenance and construction, nor a body of troops, in either the regular service or the militia, trained in the construction and repair of railways. These elements in our army would have to be recruited, organized and equipped after the beginning of a war. Our general staff has studied this matter and has prepared regulations governing the use of railways, both within the theatre of war and without. These regulations are partly based on the practice during the civil war and partly on the studies of the general staff. They are embodied in Field Service Regulations, United States Army, 1914, Part III, Article V and Article VII, and place the operation, maintenance and construction of all military railroads in advance of the base, under the corps of engineers, which would be assisted by such other officers and civilians as would be necessary. The army has also issued various manuals on this subject. One of these is "Professional Paper No. 32, Corps of Engineers, U. S. Army, Military Railways, by Major William D. Connor, Corps of Engineers, U. S. Army," which contains much valuable information as to railroads and military railroads. Part IV of the Engineers' Field Manual is devoted to railroads and includes information and regulations as to location, construction, operation and maintenance in the theatre of war.

Apparently we are not deficient in literature on this subject, but evidently need to devise means to utilize the wonderful resources in organization, men and material, of the railroads of the country.

The engineer officers of our army have no opportunity to practice the art of railroad operation, construction and maintenance in time of peace; neither have our railroad officers any opportunity to acquire the military knowledge they should have in order to perform their railroad duties efficiently in the zone of military hostilities.

It is believed that by the co-operation of our army officers and our leading railway officials, much good would result. The nation can count in the future, as in the past, on the railroads doing their share in any emergency, but by getting together in time of peace, much needless friction and misunderstanding can be prevented.

Much light can be obtained on this problem by a study of the way it was handled during the civil war, and in this case the government had to rely on practical railroad men from civil life as there was no department of the army competent to handle it.

In the early days of the war a conference of the officials of the loyal roads was held with the government officials, and rates for the transportation of troops and supplies were agreed on, which were adhered to throughout the war in spite of a depreciated currency and rising prices.

At the very outbreak of the war, Thomas A. Scott, then vice-president of the Pennsylvania Railroad, was called to the government's assistance and succeeded in reopening railway communication between Philadelphia and Washington, opening a line by way of Annapolis and Perryville. On May 23, 1861, Mr. Scott was appointed general manager, government railways and telegraphs, and immediately proceeded to place the army transportation on a business basis. On August 1, 1861, he was appointed assistant secretary of war, being the first to hold this office, but he resigned June 1, 1862, resumed his duties with the Pennsylvania, and soon afterwards became its president.

By an act of Congress of January 31, 1862, the president was authorized to take charge of the railways and telegraph lines in the United States, and on May 25, 1862, the president issued an order, taking possession of all railways in the United States, but outside the zone of hostilities this possession was only nominal, and as long as preference was given to military transportation, the operation of the railroads was not interfered with. Within the theater of war, however, the railroads were actually operated by the war department. David Craig McCallum, on February 11, 1862, was appointed colonel and additional aide-de-camp, and assigned as military director and superintendent of railroads in the United States, a position which he held until the close of the war; and he was later promoted to the grade of brevet brigadier general, and still later to brevet major general.

McCallum was a practical railroad man. He was at first an architect and builder, but was afterwards a constructor of railroad bridges, and then became general superintendent of the Erie Railroad. He seems to have managed the military railroads in a thoroughly efficient manner. Numerous other experienced railroad men entered this department of the government service and it seems to have been administered with unusual efficiency. The principal trouble with the department was the tendency of the military commanders to interfere with railway operation. In endeavoring to operate single-track railways by the telegraphic train order system, the wires would often be pre-empted by military messages, so that train orders could not be sent. Trains had then to be operated by flagging ahead—a very slow and uneconomical method. Drastic orders had to be issued to prevent this interference. The military officers at times did more to interrupt the smooth operation of the railroads than the raids of the enemy. Finally special order No. 337 was issued by the war department under date of November 10, 1862, one paragraph of which was as follows:

"No officer, whatever his rank, will interfere with the running of the cars or engines as directed by the director of military railways or of his agents. Anyone who so interferes will be dismissed from the service for disobedience of orders."

The promulgation and enforcement of this order permitted the successful operation of the military railways by those trained in this work.

*A paper read before the New York Railroad Club, November 19.

Another railroad man who also did notable work with the military railroads was Colonel E. C. Smeed, afterwards chief engineer of the Union Pacific. Before the war he had extensive experience with high, wooden, railway trestle bridges, having been employed on the construction of the first Portage viaduct of the Erie Railroad, and also on the numerous high trestles on the Catawissa Railroad. He was placed in charge of bridge construction and performed some notable feats, one of which was the construction of the Potomac Creek bridge, 400 ft. long, 100 ft. high, and containing over two million feet of lumber cut in the woods nearby, in nine working days with common soldier labor. This is the bridge that Lincoln passed over and said "There is nothing in it but bean poles and corn stalks."

The bridge department became so efficient that the negroes said "The Yanks could build bridges in less time than the Reds could burn them down."

On the conclusion of the war this military railway organization was disbanded with the rest of the volunteer army, and the army was reduced to its peace proportions without any organization or corps of officers to continue this railroad work. The Spanish war found us no better prepared or organized to handle our railroad problems than we were in 1861; only the problems were much simpler and easier. Our railroads were not well prepared to deliver troops at mobilization camps located at points without proper terminal facilities, nor did proper facilities exist for the concentration of troops, supplies and baggage at points of embarkation, but the railroads made every effort to remedy these defects and to create the necessary facilities.

The engineer troops of the regular army were augmented by three regiments of volunteer engineers, but no engineer railway troops were formed and, as it turned out, none were seriously needed.

The above facts and the use of railways in the civil war, fade into insignificance compared with the use of these agents in the present European war.

As this country is now considering the state of its defense, and as its railways form such an important element in this problem, it would seem to be a fitting time for the railroad men and the army officials to get together. A board of eminent civilian inventors, scientists and engineers are assisting the sea soldiers in their problems, and it is believed that the railroad men could perform equally valuable services for our land soldiers. There should be a railway section of the general staff of the army which should be assisted by an advisory board of railway operating officials, engineers and contractors, including representatives of the railway supply houses.

Some of the things that could be accomplished by discussion between the railroad and army men are as follows: the preparation of regulations governing the military railways within and outside the zone of hostilities; the ascertaining of the best means of recruiting, organizing and training engineer railway troops; discussion of the best means of affording opportunity for officers of the army to obtain practical experience in railway operation, maintenance and construction; the arranging of means for railroad men to obtain some military training by instruction camps similar to the business men's training camps held during the past year, etc.; discussion of the proper railroad facilities to be provided at mobilization and concentration camps for the rapid entraining and detraining of troops, their equipment and supplies.

Those who wish to study this subject further will find valuable matter in "The Operation and Maintenance of a Railroad in a Theatre of War" by Major W. D. Connor, Corps of Engineers, United States Army. Journal of the Military Service Institution, volume xxxvii, page 234 and page 445, 1905.

DISCUSSION

Col. B. W. Dunn, chief inspector, Bureau of Explosives, opened the discussion, giving it as his opinion that the American Railway Association should keep in close touch with the general staff of the United States Army and make such preliminary arrangements as would provide smooth working of the railways in the moving of troops and supplies in the case of war. He suggested that

army officers be appointed temporarily to railway positions such as assistant to the general manager in order that they might obtain some knowledge of actual railway operating conditions.

Major-Gen. Leonard Wood, commander of the Department of the East, U. S. Army, stated that the one word before all others on this question is organization. This applies to the army, but beyond that it applies to the system of handling the forces of the country back of the army. He emphasized the remarks of Colonel Dunn and advocated the formation of a railway brigade which would be experienced in quick repair work, as army engineers are not capable of doing this class of work quickly and efficiently. The organization should be thought out well in advance and should be such that the country's railway systems would be turned over to government use under its own management. Such a railway organization is vital to the success of placing of railroads in a proper position in case of war and also in the case of its being necessary to invade other countries. In the latter case, the repair organization would be required to rebuild and repair railways in the invaded district.

Colonel McClellan, of the Quartermasters' branch of the war department, spoke of the mistakes made in the movement of troops to Tampa in 1898, stating that many of these were entirely unnecessary. He considered the suggestions of Mr. Snyder's paper fundamental and gave as his opinion that something must be done at once in preparing and working out a plan for using the railroads in wartime. It should be remembered that the movement of troops in large numbers practically puts a railroad out of business for other purposes.

Colonel Baker, of the Quartermasters' branch of the war department, emphasized the remarks made by some of the previous speakers and stated that the war department has been in touch with all the passenger associations of the country and is perfecting plans for the movement of troops and also making arrangements as to the expeditious movement of the impedimenta which necessarily accompany them. Arrangements have also been perfected for the marking of cars as to what branch of the army the contents are intended for. This saves much time and will avoid much of the trouble experienced in 1898. There should also be a close arrangement between the war department and the railroads for providing extra side tracks wherever needed and all railroad departments should be brought into close alliance with the officers of the army. Colonel Baker stated that it is probable that the proposed new army bill will provide for a reserve corps which will include railroad men of all branches who can be used in a directing capacity.

Others who took part in the discussion and advocated similar arrangements between the government and the railways were: F. E. Herriman, Col. Charles McKinstry, William Barclay Parsons, Capt. A. R. Piper, Lieut. Col. E. W. V. C. Lucas, and F. Stanwood Menken, president of the National Security League.

ALTAI RAILWAY IN SIBERIA OPENED.—Traffic on the Altai Railway in Central Asia opened on Wednesday, 14 months earlier than the date contemplated. The railway has a total length of 501 miles. The new line opens up a huge and wealthy region of Siberia which has hitherto been deprived of means of communication.

BRITISH RAIL EXPORT.—The war is still exerting an exceedingly depressing influence upon British rail exports, which amounted in September only to 15,800 tons, as compared with 39,185 tons in September, 1914, and 26,283 tons in September, 1913. The aggregate shipments to September 30, this year, were 205,952 tons, as compared with 365,939 tons in the first nine months of 1914 and 379,105 tons in the first nine months of 1913. The colonial demand, which is still the mainstay of the export rail trade, was as follows during the first three-quarters of the last three years:

	1915. Tons.	1914. Tons.	1913. Tons.
South Africa	33,980	47,564	48,330
British India	37,714	123,342	103,527
Australia	55,973	107,115	96,185
New Zealand	17,932	15,259	26,275
Canada	9	122	300

USING TIME-TABLES TO APPEAL TO SHIPPERS

The Southern Railway is using space in its time-table folders to urge shippers to co-operate with the road in its campaign to reduce the number of claims for loss and damage to freight. In the October folder a page is devoted to the following appeal to shippers, signed by W. H. Gatchell, superintendent of agencies:

"Did it ever occur to you to take a look every now and then through your shipping department to see how your people are boxing, crating, barreling, sacking or bailing your goods for transportation, to satisfy yourself that they are giving the necessary protection to the property you are shipping out to your customers and to see that your shipments are properly marked, with old marks erased and the bills of lading carefully and legibly made. If not, try it—you will find it interesting.

"Many shippers have thanked us for bringing to their attention instances of bad packing, use of inferior containers, illegible marking and poorly written bills of lading, of which they were not cognizant.

"You appreciate, we are sure, what all of this means to you and to the carrier in making a safe and accurate delivery of your property to the consignee.

"Your co-operation is necessary. We need your assistance. We want to help you. Won't you help us?

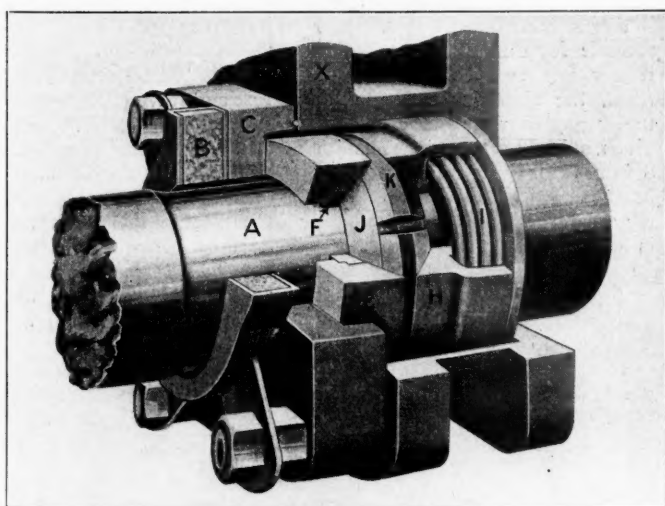
"Freight properly packed and correctly marked is already half-way to destination.

"There is no section of the South that the Southern does not serve. Please help us to do it effectively."

One prominent shipper on the line wrote to Mr. Gatchell that after reading this article he had ordered the expenditure of \$10,000 a year for better packing of his company's freight shipments.

SULLIVAN METALLIC PACKING

The process of applying packing to the pistons and valve rods of locomotives presents very little difficulty. It is only necessary that the packing be of a material that will not melt at the temperature of steam, and will still be soft enough not to injure the rod. If this packing is bored out to an exact fit on the rod it will be tight. As the engine continues in service, however, the ring will become worn. A packing is thus desirable that will permit of continued wear until the packing rings are worn out. A packing ring that is cut square across the ring is believed to



Sullivan Piston and Valve Stem Packing

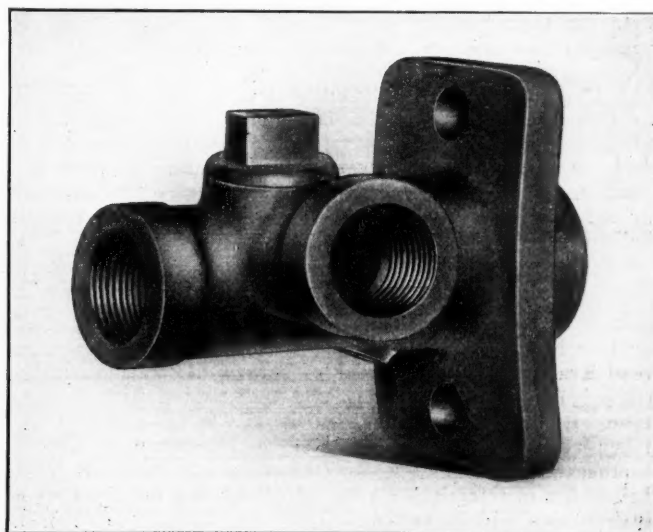
be preferable to one which is cut tangentially, as in the latter case the short ends are liable to become broken, thus permitting blows. Where the square cut ring is used there must be a clearance between the segments of each ring, and in order to make the packing tight two rings must be used, having the parting of their segments staggered. These rings will wear until the ends

of the segments come in contact, when the ends should be filed to give the proper clearance. Another desirable feature is to have the packing rings maintain a uniform bearing on the rods so that the ring will wear evenly throughout its bearing surface.

To meet these conditions the Jerome-Edwards Metallic Packing Company, Chicago, has placed on the market the improved Sullivan piston and valve stem packing. In the illustration, A is the piston rod; B, the swab cup; C, the gland; E, the vibrating cup; F, the brass ring; H, a combined spring case and follower; I, the spring; J, the cone packing ring with a double bevel; K, the second packing ring; and X, the stuffing box. From this construction it will be seen that the spring I presses the packing ring K against the packing ring J (with the double bevel), forcing it onto the rod and at the same time against the vibrating cup E, which, being beveled, also forces it against the rod. With this construction steam leaks between the rod and the packing ring, or between the outside of the packing ring and the inside of the vibrating cup, are eliminated; in addition, the double bevel on the cone ring, J, tends to keep it central and the wear will thus be uniform.

SMOKEBOX BLOWER FITTING

The illustration shows a locomotive blower fitting which is provided with a flange for direct attachment to the side of the smokebox. It has three pipe connections, the inside connection leading to the blower nozzle, the right angle connection



Smokebox Blower Connection

to the blower pipe in the cab, and the other to the roundhouse blower connection. A check valve, readily accessible through the cap shown in the illustration, automatically closes the roundhouse blower connection when the engine blower is in operation. It raises when the roundhouse blower is in operation and allows steam to pass into the smokebox. All passages are made for 1¼-in. pipe. It is manufactured by the Barco Brass & Joint Company, Chicago.

A NEW PORT FOR RUSSIAN PRODUCE.—The new railway from the Russian capital to Ekaterina, a port in the Arctic which is free from ice throughout the year, was to have been open for war traffic at the beginning of November. This new line has been built under the direction of American engineers, an army of 10,000 men, mostly prisoners, having been employed upon it. The terminus on the edge of the Arctic is Ekaterina, on the northern coast of the Gulf of Kola, where large docks and sheds have been constructed. This new railway is double tracked, 1,220 miles long, and has been built in six months. Boats unable to reach Archangel will be able to go to Ekaterina at all seasons of the year.

General News Department

The shops of the Norfolk Southern at Newbern, N. C., were destroyed by fire on November 16; loss, \$200,000. Two locomotives were damaged and several freight cars were burnt up.

The American Railway Association has abolished the office of general agent held by Arthur Hale. Mr. Hale will retain the office of Chairman of the Committee on Relations between Railroads.

The Nashville, Chattanooga & St. Louis reports that its expenses for clearing wrecks in the last fiscal year amounted to only \$6,521, which is equal to 59 cents out of every \$1,000 revenue received. Taking the records of all the railroads in the southern group, it appears that the average cost of clearing wrecks was \$2.40 to every \$1,000 gross revenue.

Martin H. Conroy, a contractor, of Brooklyn, N. Y., has been convicted of manslaughter in the second degree for causing the death of John H. Joyce, a special officer of the Long Island Railroad, by running against him with his automobile on September 9 last at a highway grade crossing; and has been sentenced to three months' imprisonment. Conroy started to run around other automobiles which had been stopped at the crossing; witnesses testified that he ran down Joyce at 40 miles an hour.

In the United States district court at Cleveland, Ohio, November 18, the Delaware & Hudson Company and F. D. Underwood, president of the Erie Railroad, were fined \$1,000 and \$2,500 respectively for violation of law in allowing passengers to ride in a private car without exacting the extra charge prescribed for such accommodation. President Underwood carried the passengers in his car from a point in Ohio to Binghamton, N. Y., and the car was taken east from Binghamton by the Delaware & Hudson. This action of the court follows indictments found last May.

The eastern associations of general chairmen of the Brotherhood of Locomotive Engineers and the Brotherhood of Locomotive Firemen and Enginemen, in a joint session at Cleveland on November 17, decided to join the Brotherhood of Railroad Trainmen and the Order of Railway Conductors in their campaign for an 8-hour day and time and a half for overtime. It is said that formal action on this movement is to be taken at a meeting of the executive committee of the four brotherhoods at Chicago on December 15, when the formal ballot for a referendum vote of all of the members of the organization will be prepared.

Disastrous Collision Near Columbus, Ga.

In a butting collision between a northbound passenger train and a southbound special carrying a show, on the Central of Georgia, four miles east of Columbus, Ga., on Monday of this week, 7 or more persons were killed and a large number injured. The engines of both trains were wrecked; the cars of the passenger train were of steel and were not badly damaged. Of the 28 cars in the show train, 10 or more were wrecked and destroyed by fire and large numbers of wild animals as well as many tame ones were killed. A number of wild animals escaped.

Tribute to Memory of W. F. Allen

The American Railway Association at its meeting in Chicago on November 17, adopted the following resolution:

"In memory of William Frederick Allen, secretary of The American Railway Association from the date of its organization, April, 1886, to November 9, 1915; general secretary and treasurer from June, 1909, to November 9, 1915; secretary of the General Time Convention from April, 1875, and secretary of the Southern Railway Time Convention from October, 1877, until their consolidation in 1886 at which time The American Railway Association was created; originator of the idea of Standard Time, a system by which all the railways of the United States are operated.

"Mr. Allen's industry and loyal co-operation with his associates during a period of 40 years were always most helpful and welcome to them, and they record with profound sorrow his death at his home in South Orange, New Jersey, on the afternoon of November 9, 1915, in the seventieth year of his age.

"His great ability, high character and forceful and amiable personality endeared him to all who knew him, and inspired their admiration, friendship and esteem. In his death the association has lost an able and resourceful officer, and his friends and associates deeply mourn the loss of a friend and counsellor.

"Resolved, That this tribute to his memory be inscribed on the minutes of this association, and that an engrossed copy be delivered to his family, to whom The American Railway Association tenders its sympathy in their great sorrow."

Demands of St. Louis Switchmen

The Brotherhood of Railroad Trainmen has presented to the Terminal Railroad Association of St. Louis a demand for an 8-hour day, time and one-half for overtime, and increases in rates of pay for the switchmen employed by that road; but it is proposed to include in the eight hours 30 minutes for lunch, so that the men would actually work only 7½ hours, instead of 10, as at present. The rates of pay demanded are in some cases higher than those now paid for 10 hours. The proposed rates are \$4 a day or 50 cents an hour for foremen, in place of the present rates of 40 cents an hour for night foremen and 38 cents for day foremen, and for helpers \$3.70 a day, or 46½ cents an hour in place of the present rates of 37 cents for night men and 35 cents for day men. The increases asked, therefore, are more than 25 per cent per hour. After having in the past secured higher rates for night work the men now propose to apply the higher rates for day work also.

The demand for time and one-half for all overtime in excess of 8 hours is based on the present rates and would result in overtime rates of 60 cents an hour for night foremen, or one and a half times the regular hourly rate, 57 cents for day foremen, or 1.43 times the regular hourly rate, 55½ cents for night helpers, or 1.18 times the regular rate and 52½ cents for day helpers, or only 1.11 times the regular hourly rate.

The standard meal hour rules on this and other roads now provide for one full hour off about the middle of the day, and if for any reason the time is not allowed within the limits fixed, the men are paid for the hour and given 30 minutes under pay in which to eat the meal. Now they propose to be given only 30 minutes for lunch, but to include that time in the 8 hours for which they are to be paid, and if the 30-minute lunch period is not allowed in the fifth hour after starting work they demand double-time pay for each minute the lunch time is delayed after 4½ hours. They further demand that they be not required to take meals in the yards of other roads; so that if a man is working in another yard when his meal time arrives he will collect extra pay for the time required to take him back to his own yard.

The demands also contain other provisions restricting the amount and character of the work to be required of switchmen, etc., and provide that at least 95 per cent of the switchmen employed shall be members of the B. R. T.

Reunion of B. C. R. & N. Men

A reunion of 1,483 old employees and officers of the Burlington, Cedar Rapids & Northern Railway, which is now a part of the Rock Island system, was held at Cedar Rapids, on October 1 and 2, and was attended by men who had worked on the road previous to its absorption 13 years ago, who had come from all parts of the country, many of them now being prominent railway officers on other roads, and including 200 now employed on the Rock Island. The program included the reception and registration, a picnic and dinner at Bever Park,

and a fellowship meeting in the evening of October 1, at which speeches were made by George A. Merrill, division superintendent of the Chicago, Rock Island & Pacific; James E. Hannigan, chairman of the Southwestern Passenger Association, formerly general passenger and ticket agent of the B. C. R. & N.; Gerrit Fort, passenger traffic manager, Union Pacific system, formerly a clerk on the B. C. R. & N., and others. On the following day the party visited the old general office building of the road, decorated the graves of deceased employees at the local cemeteries, and enjoyed a ride on an original B. C. R. & N. train, made up of the first engine and cars used on the road. Those who attended the reunion agreed that it was one of the most successful affairs of the kind ever held, and it was decided to have more reunions in future of the same kind.

The New Haven Trial

Mr. Mellen, testifying on Monday for the government in the action against the former directors of the New Haven to show conspiracy to violate the Sherman Anti-Trust law, said that Mr. Roosevelt, then president, in 1907 advised him to buy the Boston & Maine. "But he told me," Mr. Mellen said, "that he could not do anything to help me out if the New Haven got into trouble over the deal. Roosevelt said, 'If you do anything, you do it at your own risk, and you must not come back to me; but I would advise you to buy.'"

The stock of the Boston & Maine was acquired by the New Haven on July 13, 1907, through the exchange of 109,948 shares of one company for a like quantity of stock of the other. The Massachusetts legislature, however, by the Cole act, passed on June 27, 1907, forbade the New Haven to purchase more stock or to vote the stock of the Boston & Maine already held, and this condition lasted until in the summer of 1908 a bill was passed permitting the New Haven to acquire the Boston & Maine.

When Mr. Mellen spoke to Mr. Roosevelt the latter first sent him to Franklin K. Lane, then an Interstate Commerce Commissioner. There had been a suspicion at the time that the Boston & Maine might be acquired by the Canadian Pacific or the Grand Trunk. Mr. Lane was particularly appreciative of the danger of permitting the railroads of the country to fall under alien control and was chiefly interested, according to Mr. Mellen in the military aspect.

On Monday when the government attempted to put in evidence showing that New Haven had used improper means to promote legislation in Massachusetts, relating to the Boston Railroad Holding Company, the court on objections by the defense ruled that the defendants could not be tried on any offense not included in the indictment. The court said the indictment did not charge that the defendants had used bribery.

On Tuesday, R. L. Batts, counsel of the government, took up the transaction whereby John L. Billard, the Meriden, Conn., coal dealer, about June, 1908, paid the New Haven \$13,742,500 for 109,948 shares of the Boston & Maine, after the Massachusetts legislature had passed an act requiring the New Haven road to divest itself of its Boston & Maine interests. In response to questions, Mr. Mellen said:

"About the time we had decided to sell the New Haven's shares of Boston & Maine stock, Mr. Billard, whom I had known about fifteen years as a reputable coal dealer in Meriden, came to my office by appointment. He said that he would like to buy our Boston & Maine stock. He said frankly that he did not have enough money to buy the stock. I told him that we had to get rid of it and we would be glad to help anybody who would step into our shoes and take the Boston & Maine stock off our hands at \$125 a share. As a result of our negotiations I made arrangements with Mr. James Stillman of the National City Bank to lend Mr. Billard \$11,000,000 upon the Boston & Maine stock. Then in addition to the \$11,000,000 which Mr. Billard was able to pay us in cash he gave us his note for \$2,742,500, making a total of \$13,742,500 for the stock." Mr. Billard was later loaned various sums of money all of which he returned with interest. In connection with these loans Mr. Mellen consulted nobody, merely authorizing the treasurer of the New England Navigation Company to pay the needed amounts. A letter to the house of representatives of Massachusetts was read showing that the transactions with Billard were bona fide and that there was no understanding or agreement affecting the contract or ultimate destination of the Boston & Maine stock turned over to him.

Monday De Lancey Nicoll, of counsel for the defense, filed a

brief in support of a motion to have the court and jury taken on an extended trip over the New Haven.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, date of next or regular meetings, and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

- AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—F. A. Pontious, 455 Grand Central Station, Chicago. Next meeting, January, 1916, Atlanta, Ga.
- AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3rd Wednesday in month, except July and August, 220 W. 57th St., New York.
- AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York. Annual meeting, December 7-10, 1915, New York.
- AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, Supt. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January 18-20, 1916, Chicago.
- ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 75 Church St., New York. Next meeting, December 14-15, 1915, St. Louis, Mo.
- CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.
- CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.
- CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.
- CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual meeting, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.
- ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.
- GENERAL SUPERINTENDENT'S ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.
- NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, 2d Tuesday in month, except June, July, August and September, Boston.
- NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meetings, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.
- NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.
- PEORIA ASSOCIATION OF RAILROAD OFFICERS.—M. W. Rotchford, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.
- RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.
- RAILROAD MEN'S IMPROVEMENT SOCIETY.—J. B. Curran, Erie R. R., 50 Church St., New York. Meetings, alternate Thursdays, October to May, Assembly Rooms of Trunk Line Association, 143 Liberty St., New York.
- RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 30 Church St., New York. Annual meeting, December, 1915, Waldorf-Astoria Hotel, New York.
- RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Monongahela House, Pittsburgh.
- RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.
- ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.
- SALT LAKE TRANSPORTATION CLUB.—R. E. Rowland, David Keith, Bldg., Salt Lake City, Utah. Regular meetings, 1st Saturday of each month, Salt Lake City.
- SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Piedmont Hotel, Atlanta.
- TOLEDO TRANSPORTATION CLUB.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.
- TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.
- TRAFFIC CLUB OF NEWARK.—John J. Kautzmann, P. O. Box 238, Newark, N. J. Regular meetings, 1st Monday in month, except July and August, The Washington, 559 Broad St., Newark.
- TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.
- TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Gen'l Agt., Erie, R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings, bi-monthly, Pittsburgh.
- TRAFFIC CLUB OF ST. LOUIS.—A. F. Versen, Mercantile Library Bldg., St. Louis, Mo. Annual meeting in November. Noonday meetings October to May.
- TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, Superintendent's office, N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.
- UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.
- WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.
- WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Building, Chicago. Regular meetings, 3d Tuesday in month, except June, July and August, Karpen Bldg., Chicago.
- WESTERN SOCIETY OF ENGINEERS.—E. M. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

REVENUES AND EXPENSES OF RAILWAYS

THREE MONTHS OF FISCAL YEAR ENDING JUNE 30, 1916

Name of Road.	Average mileage operated during period.	Operating revenues				Operating expenses				Net from operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decrease) comp. with last year.
		Freight.	Passenger.	Total (inc. misc.).	Way and structures.	Maintenance of equipment.	Traffic.	Transportation.	Miscellaneous.				
Chesapeake & Ohio Lines.....	2,374	\$9,287,497	\$1,707,978	\$11,600,951	\$1,324,194	\$2,376,297	\$158,484	\$3,274,648	\$7,406,368	\$2,554,583	\$345,360	\$9,971,163	\$1,024,418
Chicago & Alton.....	1,052	2,565,176	397,898	3,978,968	303,498	866,180	106,675	1,279,859	2,851,186	1,127,782	129,218	997,163	—30,187
Chicago, Burlington & Quincy.....	9,366	15,806,071	6,279,000	24,428,638	3,331,810	3,819,859	415,592	7,032,368	15,312,593	9,116,044	1,060,226	8,055,818	—600,310
Chicago & Eastern Illinois.....	1,282	2,860,506	798,004	3,975,490	685,453	967,497	64,833	1,325,247	3,171,722	893,767	160,000	641,951	—364,099
Chicago & Erie.....	270	1,509,667	1,121,454	1,821,509	182,219	180,708	50,481	663,466	1,553,332	668,177	61,500	606,677	36,093
Chicago Great Western.....	1,427	2,372,583	919,379	3,613,995	566,127	638,754	137,972	1,197,193	2,660,860	933,136	138,742	1,828,56	—123,061
Chicago, Indianapolis & Louisville.....	622	1,233,345	498,575	1,878,001	216,187	318,980	57,994	598,624	1,246,109	631,892	81,197	550,557	105,965
Chicago Junction.....	13	.....	.....	534,006	65,415	47,899	3,000	.....	17,685	401,677	132,328	125,010	32,205
Chicago, Milwaukee & St. Paul.....	10,076	17,546,750	5,499,748	25,765,897	2,813,478	3,822,314	482,991	8,741,639	47,075	15,719,342	1,857,196	8,683,629	946,764
Chicago & Northwestern.....	8,108	14,108,432	6,173,361	22,717,897	3,510,293	3,683,887	383,112	7,443,894	15,311,953	7,185,944	1,155,000	6,024,000	—284,361
Chicago, Peoria & St. Louis.....	255	322,989	84,425	432,607	77,630	181,931	16,885	165,822	16,329	358,597	13,698	60,313	—23,751
Chicago, Rock Island & Gulf.....	477	496,018	170,426	725,745	142,680	102,287	27,335	262,002	22,854	563,606	162,139	130,124	—19,107
Chicago, Rock Island & Pacific.....	7,655	11,187,105	5,330,934	17,900,174	3,013,551	3,306,348	438,347	6,315,833	15,821	442,995	4,033,948	3,198,299	—1,033,115
Chicago, St. Paul, Minn. & Omaha.....	1,753	2,703,412	1,483,120	4,558,933	805,501	600,199	89,034	1,550,553	110,732	3,200,089	250,747	1,106,855	—306,975
Chicago, Terre Haute & S. E.....	374	468,669	48,988	533,124	91,505	106,243	10,833	149,604	24,935	385,278	31,250	116,570	—20,283
Cincinnati, Hamilton & Dayton.....	1,003	2,201,870	456,055	2,933,469	444,004	486,580	56,891	1,059,499	2,118,470	854,999	102,327	751,622	138,569
Cincinnati, Northern.....	216	1,785,267	426,562	2,388,000	258,110	575,757	68,074	1,335,338	1,071,661	132,633	6,500	116,093	15,692
Cincinnati, New Orleans & Tex. Pac.....	217	1,785,267	426,562	2,388,000	258,110	575,757	68,074	1,335,338	1,071,661	132,633	6,500	116,093	15,692
Cleveland, Cincinnati, Chic. & St. Louis.....	3,387	6,101,213	2,464,647	10,340,083	1,358,169	1,881,757	215,567	3,353,855	7,127,270	3,629,626	384,000	2,997,768	536,822
Colorado Midland.....	338	311,531	82,947	424,833	84,795	94,299	22,658	174,382	16,394	396,058	30,000	3,225	—43,003
Colorado & Southern.....	1,089	1,438,837	450,200	2,033,245	324,444	433,548	28,988	571,807	1,450,778	582,467	105,000	477,363	104,531
Cumberland Valley.....	164	600,698	197,821	821,030	90,089	88,145	12,586	240,376	23,850	457,379	17,383	346,267	111,580
Cripple Creek & Colorado Springs.....	1,160	280,799	109,599	396,432	58,778	41,051	15,340	94,374	10,552	220,094	17,338	157,248	.....
Delaware, Lackawanna & Western.....	959	7,644,459	2,418,145	11,194,582	1,998,763	1,668,089	214,570	3,326,962	230,501	6,915,272	4,279,310	559,800	146,854
Denver & Rio Grande.....	2,577	4,302,002	1,826,856	6,689,249	1,025,723	983,081	119,274	1,678,741	146,248	4,137,652	255,159	2,719,112	626,510
Detroit & Mackinac.....	393	161,273	90,365	273,807	33,924	48,850	6,592	96,962	8,026	195,246	21,566	56,996	—14,282
Detroit & Toledo Shore Line.....	81	327,673	330,509	38,633	38,633	21,759	17,626	90,525	8,004	163,441	167,068	150,343	17,768
Detroit, Grand Haven & Milwaukee.....	191	513,000	161,500	774,041	63,028	82,691	16,968	309,650	12,673	487,395	18,310	275,246	201,865
Detroit, Toledo & Iron Range.....	441	406,803	48,719	608,933	60,308	65,338	11,405	194,040	17,703	348,794	16,500	123,632	13,127
Duluth & Iron Range.....	273	2,502,571	54,125	2,623,847	183,320	232,889	3,539	478,042	27,103	931,086	1,692,762	1,556,365	521,721
Duluth, Missabe & Northern.....	370	4,344,251	80,938	4,566,375	333,097	374,133	6,437	578,572	28,764	1,305,345	3,261,030	250,709	3,010,231
Duluth, St. Louis & Atlantic.....	628	576,938	266,357	937,157	172,035	104,537	22,167	292,705	22,934	330,061	51,000	250,651	113,579
Duluth, Winnipeg & Pacific.....	185	266,935	48,580	327,549	38,314	33,494	4,837	103,725	17,416	190,642	16,310	111,597	105,881
El Paso & Southern Pacific.....	1,027	1,882,601	356,878	2,383,289	413,534	318,081	53,659	597,213	102,474	1,502,370	880,919	104,668	84,089
Elgin, Joliet & Eastern.....	776	2,756,047	40	2,906,904	258,578	460,697	18,922	722,996	58,517	1,515,449	105,225	1,282,030	295,336
Erie.....	1,988	11,970,924	2,683,442	16,031,051	1,412,605	2,344,666	282,962	5,082,763	104,003	9,470,487	505,962	6,042,475	2,331,167
Florida East Coast.....	745	603,902	480,721	1,084,898	201,787	172,600	17,694	447,291	82,836	895,078	139,820	55,519	31,249
Fort Worth & Denver City.....	454	862,607	281,812	1,356,253	194,287	249,112	20,856	392,416	45,043	91,080	445,173	50,149	395,024
Galveston, Harrisburg & San Antonio.....	1,351	2,031,092	762,069	2,923,215	375,938	394,560	83,429	1,042,363	31,734	2,018,296	904,919	138,808	99,668
Great Northern.....	8,102	13,930,566	3,957,231	19,882,788	2,033,417	1,938,597	299,507	4,871,546	158,808	9,455,00	32,784	76,511	—80,612
Gulf & Ship Island.....	308	322,774	90,044	439,025	45,659	76,835	7,752	107,508	18,910	257,436	120,910	158,320	31,000
Gulf, Colorado & Santa Fe.....	1,938	2,631,984	850,581	3,686,954	901,865	606,329	87,964	1,328,129	101,575	3,018,580	688,374	174,609	492,663
Hocking Valley.....	351	1,476,187	237,732	1,822,926	179,288	288,180	24,895	503,929	44,343	1,039,743	83,183	112,200	147,715
Houston, East & West Texas.....	195	219,482	83,627	324,453	73,776	57,211	6,056	105,307	9,331	253,449	17,425	53,543	14,201
Houston & Texas Central.....	895	1,146,885	399,680	1,669,075	233,002	272,885	47,814	549,321	58,298	1,177,251	401,824	88,777	402,400
Illinois Central.....	4,767	11,282,735	3,525,664	16,165,253	2,634,444	3,845,732	300,981	5,107,581	431,535	12,369,332	3,795,920	809,100	244,137
Indiana Harbor Belt.....	110	.....	.....	823,612	107,322	77,864	8,500	303,125	22,993	515,804	22,649	281,075	31,249
International & Great Northern.....	1,160	1,517,459	446,574	2,129,646	335,426	399,476	60,178	875,469	85,691	1,732,072	377,573	303,079	220,085
Kanawha & Michigan.....	777	750,532	98,367	1,019,657	121,789	173,716	26,179	220,349	21,169	546,641	34,997	288,462	6,998
Kansas City, Mexico & Orient.....	1,442	9,419,996	1,323,160	11,456,997	1,335,089	2,228,597	35,196	4,670,652	29,513	629,936	36,535	55,469	—165,886
Kansas City Southern.....	837	1,887,994	386,308	2,509,492	258,257	247,230	78,909	801,161	102,977	1,450,117	1,059,376	132,109	926,348
Lake Erie & Western.....	900	1,376,883	221,574	1,681,060	211,380	343,903	37,145	546,194	35,896	1,174,518	506,542	72,400	433,807
Lehigh & Hudson River.....	97	423,884	31,947	476,376	65,552	63,925	4,664	149,066	11,462	294,669	181,707	126,600	169,107
Lehigh & New England.....	296	826,119	3,837	873,601	123,578	93,580	5,465	190,431	14,661	427,715	445,886	18,600	124,443
Lehigh Valley.....	1,442	9,419,996	1,323,160	11,456,997	1,335,089	2,228,597	35,196	4,670,652	29,513	629,936	36,535	55,469	—165,886
Long Island.....	398	923,066	2,880,015	4,345,948	391,057	374,403	45,179	1,466,426	95,823	2,392,066	1,953,881	234,144	16,490
Louisiana & Arkansas.....	279	359,269	43,217	414,108	84,834	73,435	9,207	102,137	12,089	281,702	132,406	22,500	33,277
Louisiana Ry. & Navigation Co.....	351	432,157	88,911	556,143	89,730	83,106	18,405	177,070	14,641	382,952	173,191	28,500	144,683
Louisiana Western.....	208	327,877	164,801	530,991	72,204	107,559	20,156	149,001	18,513	379,000	30,025	121,831	81,860
Louisville & Nashville.....	5,038	10,093,568	2,929,995	13,976,649	2,109,042	2,522,729	325,166	4,070,652	78,482	9,405,713	4,570,936	3,988,699	956,491
Louisville, Henderson & St. Louis.....	200	235,052	112,837	373,301	105,136	151,888	15,696	100,578	8,947	201,244	11,400	70,605	—28,082
Maine Central.....	1,220	1,355,512	1,138,802	3,068,020	403,901	400,942	42,366	1,068,326	2,000	2,665,115	1,055,090	159,239	84,332
Michigan Central.....	1,785	5,600,281	2,954,216	9,405,589	1,228,501	1,384,092	176,597	3,163,650	146,151	6,272,350	3,365,228	3,000,967	58,186
Midland Valley.....	380	203,722	94,078	297,743	77,723	49,800	12,310	123,980	17,233	2,075,963	1,078	116,843	42,274
Minneapolis & St. Louis.....	1,646	1,927,797	555,980	2,638,696	335,695	361,635	53,829	894,046	65,262	1,710,674	938,022	92,492	83,881
Min., St. Paul & S. S. Marie.....	4,203	5,504,658	1,835,196	8,028,307	941,815	976,383	157,520	2,321,017	180,901	4,630,867	3,014,480	355,988	26,687
Missouri & North Arkansas.....	365	182,433	93,095	298,708	80,796	63,540	6,953	100,670	15,938	267,898	17,400	10,296	.....

REVENUES AND EXPENSES OF RAILWAYS

THREE MONTHS OF FISCAL YEAR ENDING JUNE 30, 1916 CONTINUED

Name of Road.	Average mileage operated during period.	Operating revenues			Way and maintenance of			Operating expenses			Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decrease) comp. with last year.		
		Freight.	Passenger.	Total (inc. misc.).	Structures.	Equipment.	Traffic.	Transportation.	Miscellaneous.	General.					Total.	
Missouri, Kansas & Texas System.....	3,865	\$5,081,800	\$2,160,272	\$7,242,072	\$1,200,745	\$1,203,917	\$164,059	\$2,701,661	\$49,209	\$332	\$5,649,499	\$2,147,947	\$413,595	\$1,731,480	—\$208,858	
Missouri, Oklahoma & Gulf.....	334	217,679	57,856	275,535	89,338	55,062	12,441	135,094	332	31,541	315,541	27,134	15,387	25,747	—42,565	
Missouri, Oklahoma & Gulf of Texas.....	125	28,703	1,067	29,770	3,018	3,562	3,449	18,561	.....	2,341	35,931	5,747	420	6,167	—6,776
Missouri Pacific.....	3,931	5,398,562	1,496,719	6,895,281	7,546,504	1,604,079	193,095	2,604,090	36,080	225,711	5,788,286	1,758,218	298,254	1,451,179	—691,473	
Mobile & Ohio.....	1,122	2,291,355	314,277	2,605,632	1,217,036	616,264	102,264	999,731	999,731	631,233	2,126,199	631,233	93,658	537,100	34,694	
Monongahela.....	75	379,435	6,689	386,124	46,923	26,000	2,359	76,968	.....	9,369	161,619	230,824	7,500	230,824	.....
Morgan's La. & Tex. R. & S. Co.....	405	627,697	245,567	873,264	158,097	177,174	33,718	375,707	7,227	7,227	787,252	182,437	62,642	119,152	—15,527	
Nashville, Chattanooga & St. Louis.....	1,231	1,976,861	712,075	2,688,936	358,809	561,846	138,444	1,029,630	27,836	100,168	2,121,553	710,138	78,000	631,586	178,927	
Nevada Northern.....	165	389,201	33,851	423,052	434,980	35,029	2,028	78,879	217	12,435	187,439	247,541	26,042	221,500	108,449	
New Orleans, Mobile & Chicago.....	402	344,566	71,265	415,831	69,109	72,328	12,323	142,296	—30	20,720	316,745	120,211	20,159	99,758	—15,092	
New Orleans & North Eastern.....	196	641,643	858,493	1,500,136	95,724	167,784	30,121	265,554	16,981	34,149	610,314	248,180	45,151	203,028	33,917	
New Orleans Great Northern.....	724	725,823	292,099	1,017,922	432,731	71,183	8,440	124,105	525	18,031	275,427	157,304	11,707	145,555	—6,354	
New Orleans, Texas & Mexico.....	283	315,865	79,010	394,875	54,680	63,612	11,436	126,417	.....	28,766	284,910	99,631	4,504	95,075	16,957
New York Central Railroad.....	5,979	27,955,665	13,468,533	41,424,198	5,400,435	7,942,184	735,745	13,966,907	687,464	1,088,244	29,820,979	18,483,610	2,320,343	16,157,837	281,498	
New York, Chicago & St. Louis.....	569	2,592,324	440,511	3,032,835	308,396	449,168	145,090	1,217,786	9,440	63,570	2,193,458	966,897	126,000	840,727	281,498	
New York, New Haven & Hartford.....	2,005	8,916,397	7,963,799	16,880,196	2,215,502	2,683,687	115,304	6,096,989	155,599	389,220	11,648,538	7,076,336	705,000	6,470,689	1,497,216	
New York, Ontario & Western.....	568	1,409,971	814,666	2,224,637	366,866	348,039	23,250	835,357	.....	48,131	1,622,143	978,969	62,950	915,988	4,050
New York, Philadelphia & Norfolk.....	112	990,006	131,614	1,121,620	115,132	234,185	14,835	434,769	.....	33,224	844,400	363,031	29,000	333,987	56,920
New York, Susquehanna & Western.....	140	568,076	150,482	718,558	804,996	66,866	90,123	3,340	32,865	17,483	522,570	282,427	39,625	242,788	51,722	
Norfolk & Western.....	2,042	12,015,451	1,525,316	13,540,767	1,960,071	1,960,071	163,287	3,396,948	25,697	205,239	8,084,167	5,902,296	504,000	5,396,434	1,649,286	
Norfolk Southern.....	908	654,065	299,846	953,911	1,028,736	147,631	23,654	37,538	449	51,242	718,583	310,153	36,853	273,300	65,009	
Norfolk Western.....	6,483	12,204,346	4,253,978	16,458,324	2,749,279	1,957,815	316,193	4,785,934	296,589	263,782	10,186,188	8,008,114	1,131,296	6,876,062	985,962	
Northwestern Pacific.....	507	482,485	1,335,397	1,817,882	179,287	124,781	17,637	375,064	.....	22,239	714,413	620,984	51,405	569,535	119,003
Oahu Railway & Land Co.....	114	365,861	64,350	430,211	30,456	27,352	2,023	80,102	.....	11,219	151,152	283,089	21,750	283,089	27,457
Oregon Short Line.....	2,259	4,060,720	1,549,204	5,609,924	836,909	645,172	111,687	1,328,018	105,662	162,031	3,186,081	2,909,664	364,264	2,545,279	336,022	
Oregon-Washington R. R. & Nav. Co.....	2,027	2,662,240	1,425,196	4,087,436	4,662,815	456,481	138,337	1,235,262	41,932	176,533	2,535,043	2,107,773	281,676	1,645,771	44,354	
Panhandle & Santa Fe.....	670	868,262	273,598	1,141,860	1,199,274	301,144	206,685	12,214	285,494	27,671	832,003	367,271	33,325	333,681	94,573
Pennsylvania Company.....	1,757	13,164,174	2,992,342	16,156,516	2,278,012	2,551,929	220,503	5,159,962	95,707	345,609	10,651,721	7,101,703	756,362	6,344,880	1,971,096	
Pennsylvania Railroad.....	4,528	37,037,503	11,045,886	48,083,389	6,566,809	9,127,732	568,463	16,804,884	101,180	235,518	34,989,927	17,592,063	1,673,232	15,693,767	3,201,540	
Pere Marquette.....	2,262	3,136,837	1,313,374	4,450,211	4,935,607	593,172	873,058	94,115	1,627,503	.....	14,754	10,208,84	3,222,005	1,613,603	1,474,196
Philadelphia & Reading.....	1,120	10,248,495	1,733,095	12,000,590	1,007,824	2,289,259	135,035	4,111,100	34,368	204,386	7,886,967	4,713,497	301,822	4,410,420	651,265	
Philadelphia, Baltimore & Washington.....	717	3,058,731	2,188,717	5,247,448	792,223	1,015,986	77,462	2,114,012	74	144,839	4,144,595	1,605,623	163,659	1,441,733	350,735	
Pittsburgh & Lake Erie.....	225	4,621,102	472,766	5,093,868	5,378,922	418,012	728,365	38,908	1,045,867	10,199	82,628	2,323,979	3,054,943	148,500	2,906,441	1,383,952
Pittsburgh, Cincinnati, Chic. & St. Louis.....	1,479	7,516,912	2,333,476	9,850,388	1,026,467	1,641,452	1,003,105	188,506	358,191	79,586	7,575,805	3,450,842	478,812	2,970,871	99,983	
Pittsburgh, Shawmut & Northern.....	294	471,737	30,542	502,279	512,312	93,469	122,342	4,325	142,304	13,578	376,639	135,624	5,358	130,315	137,784
Port Reading.....	21	311,275	226,741	538,016	390,421	33,015	39,663	115	28,663	20,378	425,464	358,339	25,758	18,271	44,440
Richmond, Fredericksburg & Potomac.....	88	366,920	374,280	741,200	683,813	36,002	10,600	28,664	8,348	20,378	425,464	358,339	25,758	25,758	18,271	44,440
Rudland.....	468	489,753	374,280	864,033	985,160	136,538	146,329	28,397	314,763	3,305	16,095	635,989	66,009	50,668	288,303	75,954
St. Joseph & Grand Island.....	258	273,288	85,453	358,741	85,078	73,403	12,793	135,463	.....	14,888	321,625	66,009	22,860	43,070	—62,035
St. Louis & San Francisco.....	4,750	7,163,375	2,855,271	10,018,646	1,826,062	1,621,273	189,845	3,320,485	.....	275,257	7,175,081	3,659,843	368,222	3,146,703	—123,910
St. Louis, Brownsville & Mexico.....	548	450,198	210,772	660,970	108,174	95,351	15,691	201,624	.....	30,371	450,481	263,481	19,500	242,939	82,070
St. Louis, Iron Mountain & Southern.....	3,363	5,607,724	1,395,859	7,003,583	1,184,219	1,561,710	187,727	2,148,835	20,466	182,702	5,534,172	2,201,688	332,805	1,858,237	—386,999	
St. Louis Merchants' Bridge Terminal.....	9	.....	.....	.....	475,157	53,665	25,617	2,387	.....	23,490	315,975	159,362	19,620	139,741	17,079
St. Louis, San Francisco & Texas.....	244	183,348	68,969	252,317	286,656	73,521	47,361	120,492	.....	13,038	260,171	26,485	3,649	22,734	—10,328
St. Louis, Southwestern.....	943	1,306,368	332,786	1,639,154	1,747,011	134,876	291,013	78,207	433,234	10,638	70,914	1,037,853	709,158	89,973	618,205	62,635
St. Louis, Southwestern of Texas.....	811	663,953	248,276	912,229	985,944	158,909	228,554	37,521	402,064	1,984	49,976	845,326	140,618	45,090	95,148	185,949
San Antonio & Aransas Pass.....	724	725,823	292,099	1,017,922	1,088,822	189,860	174,799	19,688	429,700	34,781	848,692	240,130	47,197	192,854	19,863
San Pedro, Los Angeles & Salt Lake.....	1,132	1,489,780	1,094,733	2,584,513	2,872,124	666,113	382,061	97,010	980,982	86,804	51,669	1,664,639	1,207,485	153,890	1,053,482	386,095
Seaboard.....	3,123	3,303,606	1,121,581	4,425,187	4,899,205	637,621	251,320	180,415	1,735,144	23,161	171,871	3,495,532	1,403,673	274,900	1,125,271	25,765
Southern.....	7,052	10,383,531	4,269,285	14,652,816	1,640,461	2,100,123	2,957,827	470,215	5,432,594	83,439	47,491	11,058,532	981,926	688,705	3,377,777	1,071,974
Southern Pacific.....	6															

Traffic News

In an address before the Traffic Club of Chicago on November 17, Gov. E. L. Phillipp, of Wisconsin, advocated an extension of the powers of the Interstate Commerce Commission over railroad regulation in the interest of centralized regulation and a reduction of the powers of the state commissions.

The Merchants' Association of New York has adopted a report recommending an amendment of the Cummins law regulating agreements between carriers and shippers in regard to liability for loss of freight or baggage. The proposed amendment clarifies the language relating to declarations of value by owners and shippers and stipulates that it shall not be unlawful for persons tendering property for transportation by express or as baggage to declare less than the actual value.

Dr. J. Y. Porter, chief of the Florida State Health Department, is preparing a health instruction display which is to fill three passenger cars and is to be taken around to all of the principal cities and towns in the state, the railroads having promised to co-operate in the enterprise and to transport the cars free. One of the cars will have a gasoline engine and electric apparatus and will show motion pictures; another will be equipped as a model sanitary home, and the third will contain instructive placards dealing with drugs, patent medicines and other things.

The movement of freight through the open ports of entry on the Rio Grande border into those parts of Mexico that are under control of the de facto government, is so great that the connecting lines are wholly unable to handle it promptly. The closing of the El Paso gateway to shipment destined for the region where Carranza authority exists has caused the Southern Pacific to divert all of its Mexican traffic to Eagle Pass. This has caused a blockade of freight there. The Mexican railroads are so short of cars that they can handle the traffic only in comparatively small lots. Large shipments of grain, machinery and other goods are also passing through the Laredo and the Brownsville gateways. The train movement on the Mexican lines is expected to materially improve within a short time. The shops are busy repairing old cars and engines and in building new freight cars. It is announced that all the divisions in Carranza territory are now open for regular passenger traffic, though the trains do not seem to run on any prescribed schedule.

Missouri Passenger Fare Advance Inconsiderable

The executive officers of the Missouri railroads have issued a statement calling attention to the fact that the increase in passenger fares allowed by the Missouri Public Service Commission is very small. The statement says that the impression prevails throughout the state that the railroads have been given the privilege of advancing their rates from 2 to 2½ cents a mile, and that this is a misconception, "as the conditions under which the advance is permitted prevent the railroads from getting it." The statement continues:

"The advance to 2½ cents cannot be made except upon the condition that round-trip tickets be sold at 2¼ cents a mile, and that 500 and 1,000 mile tickets, good for bearer and any number of persons for one year, be sold at 2 cents a mile.

"The sale of round-trip tickets at 2¼ cents is equivalent to a reduction of 10 per cent from the rate of 2½ cents.

"The sale of a mileage ticket at 2 cents that can be used by any number of persons is equivalent to a reduction of 20 per cent from the rate of 2½ cents and brings the purchase of these tickets within the reach of the great majority of travelers.

"The order of the commission further provides that the same facilities in travel shall be extended to the passenger purchasing transportation at 2 cents a mile as are extended to the passenger paying the higher rate.

"These conditions will make the present confiscatory rate of 2 cents a mile the prevailing rate for transportation under the order of the commission.

"Passengers would buy these mileage tickets to such an extent as to prevent the railroads, for at least one year, from getting the benefit from any substantial raise in passenger fare under the order of the commission.

"The opinion is advanced by the commission that the sale

of mileage tickets under the conditions outlined will increase travel. This theory is refuted by the actual experience of the Missouri railroads under the present 2-cent rate, which the commission admits has not increased travel sufficiently to offset the loss in revenue.

"Our opinion with respect to the effect of the changes permitted in freight rates will require more time and study, but in the meantime we are forced to the conclusion that the order, as applied to passenger rates, will result in a very small increase in revenue."

Governor Major of Missouri has criticized the decision of the commission, the members of which he appointed, declaring that he does not believe the railroads are entitled to increased rates.

Exports and Imports in September

A new record of \$300,000,000 as the value of the exports from the United States in September, 1915, gives especial interest to the statistics of foreign trade for that month just published. The Bureau of Foreign and Domestic Commerce, complying with numerous requests for advance information as to the articles making up that trade, has prepared condensed tables giving the value of the various articles and classes of articles exported. The total for September was \$300,700,000, as compared with \$156,100,000 in September, 1914. For the nine months ending with September, 1915, the total was \$2,532,500,000 as compared with \$1,467,400,000 for 1914. The largest item on the list is breadstuffs, of which \$423,400,000 was exported in the nine months as compared with \$172,800,000 in a similar period in 1914. Increased arrivals of raw materials and diminished purchases of manufacturers are the leading facts disclosed by the import statistics for September, 1915. The total was \$151,200,000, as compared with \$139,700,000 in 1914. For the nine months ending with September, 1915, the total was \$1,302,100,000 as compared with \$1,410,100,000 in 1914.

New York Export Traffic

A steamship chartering agent, quoted in a New York paper, says that much of the delay suffered by export freight at the present time is due to slow movements on the Great Lakes, especially in connection with wheat.

"We haven't had any boats delayed in New York on account of congestion here. Grain comes through from Buffalo in forty-eight hours. We have had some of our boats delayed as long as a week, however, on account of the condition of lake traffic. One of our boats was delayed five days at the Erie elevator. Last week we had a boat leave that had been delayed seven days.

"The owner of such a boat loses about \$1,000 every day that it is delayed. He can not charge demurrage, however, unless it takes more than five days, not including Sundays, to load the vessel. Demurrage is now \$750 a day on a ship, while before the war it was only \$150. The average rate on grain to England is now 17 shillings a quarter (480 pounds), while before the war it was 3 shillings 6 pence. The grain congestion here in New York now is not a flea bite to what it was in Baltimore and Newport News after the fire at the grain elevators a couple of months ago.

"The railroad people say that there is a shortage of ships. Well, we could use more if we could get them, but there were never before so many ships entering and leaving the port of New York. About a week ago we had twenty-two steamers to our consignment loading in this port. As I remember, in times of peace we seldom had more than thirteen or fourteen steamers here at once."

New York grain men say that some shippers are diverting their freight to other ports—Baltimore, Philadelphia, Boston and Portland. The volume of business shipped through New York exceeds all records.

Railroad men say that the congestion of freight is rapidly reaching the point where there is no money in the traffic for the railroads. Every day it costs more to handle the business on account of the additional cost of switching and the cost of delay to tied-up cars.

On the West Shore road last week loaded cars were standing on practically every side track from New York to Buffalo, 7,000 cars in all. Nevertheless, 4,500 cars a day are moved in and out of New York.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The commission has changed from December 1 to January 1 the date on which anthracite coal rates shall be reduced in accordance with its recent order. This is the second postponement in the anthracite case. Coal operators in the Wyoming region of Pennsylvania asked for a rehearing in relation to the proposed rates on the smaller sizes, alleging that the new orders were unjust when the rates were compared with those for the large sizes.

The Excelsior and Flax Tow Cases

Opinion by the commission.

The commission in *Keogh v. Chicago, Burlington & Quincy* (24 I. C. C., 606) decided in 1912 that the carrier's rates on excelsior, which were then higher than the flax-tow rates, from St. Paul to Chicago and points taking the same rates, St. Louis, Kansas City and Omaha were unreasonable to the extent that they exceeded the rates on flax-tow to the same points. Some of the carriers lowered the rates on excelsior to the flax-tow rates, but later proposed increases in the latter rates instead. The commission found that the increases were justified to Chicago and Peoria. It now finds that increased rates may be established as follows: From St. Paul, Minneapolis, and Minnesota Transfer, to Sioux City, 17 cents per 100 pounds; to Omaha and other Missouri River cities, to and including Kansas City, 20 cents per 100 pounds; from Dubuque, Iowa, to the Missouri River cities, Omaha to Kansas City, inclusive, 17 cents per 100 pounds. Increased rates to Des Moines are not allowed. (I. C. C., 349.)

Hearing on Illinois-Missouri Interstate Rates

A hearing on the complaint of the Business Men's League of St. Louis, charging discrimination in the interstate rates, both freight and passenger, from St. Louis to Illinois points as compared with the intrastate rates applicable from Chicago to the same points, was held before an examiner of the Interstate Commerce Commission at St. Louis last week. S. G. Hatch, passenger traffic manager of the Illinois Central, testified that many Illinois people who formerly went to St. Louis for business or pleasure are now going to Chicago because of the lower passenger fare at the state rate of two cents a mile, as compared with the interstate rate of 2½ cents. J. H. Cherry, assistant general freight agent of the Illinois Central, presented numerous statistical exhibits on the freight rates and traffic from St. Louis and Chicago to Illinois points, showing that St. Louis shippers are required to pay the five per cent increase allowed by the Interstate Commerce Commission, while the intrastate rates remain as before. Other railroad officers who testified expressed the opinion that the situation discriminates against St. Louis and in favor of Chicago.

J. D. McNamara, general passenger agent of the Wabash, testified that at Granite City, Ill., the sale of tickets to Chicago had increased 879 per cent since the situation became known generally. At East St. Louis the increase had been 170 per cent, and at Chicago the sales of tickets to Granite City increased 561 per cent and to East St. Louis 222 per cent, as passengers could buy tickets to those points at two cents a mile and then buy separate tickets to St. Louis. E. E. MacLeod, chairman of the Western Passenger Association, told of the efforts made by the railroads to obtain an increase in the rates in Illinois. Others who testified were George J. Charlton, passenger traffic manager of the Chicago & Alton, F. E. Webster, chief of Tariff Bureau, Chicago & Eastern Illinois, and F. L. Thompson, assistant chief engineer, Illinois Central.

Fourth Section Applications

In re class and commodity rates from Louisville, Ky., and Cincinnati, Ohio, to Alexandria, Va. Opinion by the Commission.

The commission grants the application of the Southern Railway for authority to continue to charge class and commodity rates from Cincinnati, Ohio, to Alexandria, Va., in connection with

the Cincinnati, New Orleans & Texas Pacific via Harriman Junction, Tenn., lower than rates on like traffic to intermediate points on the Southern Railway between Alexandria and Orange, Va.

It denies the authority to continue to charge class and commodity rates from Louisville, Ky., and Cincinnati, Ohio, to Alexandria, Va., in connection with the Chesapeake & Ohio via Orange, Va., lower than rates to intermediate points on the Southern Railway between Alexandria and Orange, Va. (36 I. C. C., 317.)

In re through rates from Buffalo, Pittsburgh and Central freight association territories. Opinion by the Commission.

The rates applied on through shipments from points in central freight association and Buffalo-Pittsburgh territories to points south of the Ohio and east of the Mississippi rivers exceed in some instances the aggregates of the intermediate rates. The commission holds that carriers have not justified the continuance of such rates and fourth section relief is denied; effective February 1, 1916.

One of the principal objections of the carriers north of the Ohio river to the construction of rates on combination of the intermediate rates is the present method of dividing such rates, which they allege is inequitable. They assert that the divisions demanded by the southern lines are excessive, and that they are forced in some cases to accept less than their local rates to the river. The commission has frequently held that the failure of carriers to agree upon divisions of joint rates does not justify the imposition of unreasonable rates. It would still less justify rates specifically violative of the statute. (36 I. C. C., 325.)

STATE COMMISSIONS

The Massachusetts Public Service Commission has dismissed a petition from the town of Revere for an order to compel the Boston & Maine to move the present or build a new station in Revere at a cost of about \$34,000 to \$47,000. The petition has been pending since 1913.

The Railroad Commission of Louisiana has cancelled its order, issued in June, 1914, requiring the Illinois Central to stop trains numbers 1 and 2 on flag, at Amite City, and the order issued in July, 1914, requiring the New Orleans, Texas & Mexico to stop trains 1 and 2 at Lottie. These cancellations are made because the courts have declared the orders unlawful. The present notice says:

"The Lottie case was heard before three federal judges and it was held that the order was void because it interfered with interstate commerce. * * * The Supreme Court of the United States has handed down several decisions involving orders adopted by the railroad commission of various states holding that where there was adequate service otherwise afforded, the requiring of interstate trains to stop at such stations amounts to an unlawful burden upon interstate commerce. * * * Our counsel has carefully examined this and other decisions and we consider that further litigation over the order in question would be useless. * * *

In addition to its decision allowing general increases in freight and passenger rates in Missouri, which was reported in last week's issue, the Missouri Public Service Commission at the same time issued its decision in a number of other cases. In one of these it ordered the restoration of Pullman sleeping cars by the Missouri Pacific on trains running between St. Louis and Joplin. These cars were taken off last spring on the ground that it did not pay to run them, the bulk of the through travel between the points named being carried by a shorter line. In view of the fact that the road will be able now to charge a higher passenger fare, the commission has ordered the service restored for a period of one year. The commission also granted the application of the roads for permission to put into effect as to Missouri intrastate traffic, the rule of the national car demurrage code increasing the demurrage charge for refrigerator cars. The commission also granted permission to the Missouri Southern to increase its passenger fare from two to three cents a mile, and also to increase its carload freight rates by approximately seven per cent. Officers of the passenger departments of a number of St. Louis roads, at an informal conference in that city last week expressed the opinion that the passenger fare increase will be largely neutralized by the more general use of mileage tickets at 2 cents a mile. The commission requires these to be made transferable and they are interchangeable as between the different roads.

PERSONNEL OF COMMISSIONS

Charles R. Russell has been appointed the fifth member of the Massachusetts Public Service Commission, succeeding Clinton White.

COURT NEWS

The hearing before Judge Youmans, of the United States District Court, at Oklahoma City, on the application of the railroads for an injunction restraining the enforcement of the Oklahoma two-cent fare law, was resumed on November 17, and is expected to last several weeks.

The Supreme Court of Massachusetts has declared unconstitutional the law of the state which provided that employees in and about steam railroad stations "shall not be employed for more than nine hours in ten hours' time, the additional hour to be allowed as a lay-off." It is held that the question was governed by a decision of the United States Supreme Court, which decided that a statute prohibiting labor for more than ten hours a day in an ordinarily healthy occupation was an "illegal interference with the rights of the individuals, both employers and employees, to make contracts regarding labor upon such terms as they think best."

Federal Safety Appliances Act Supersedes State Laws

The Indiana supreme court holds that the federal safety appliances act supersedes and invalidates the state safety appliances act, requiring railroads to provide grabirons and handholds on the side and ends of every car, so that no action for the penalty under the state law can be maintained.—*Southern Ry. Co. v. Railroad Commission (Ind.)*, 109 N. E. 759.

Liability for Loss at Sea by Connecting Carrier

The North Carolina supreme court holds that the Carmack amendment to the interstate commerce act allows the initial carrier, on being sued, to avail itself of defenses or of limitations of liability open under the federal statutes to the carrier causing the loss, although the shipment was lost at sea by a connecting carrier.—*Brinson & Kramer v. Norfolk Southern (N. Car.)* 86 S. E. 371.

Employment Contracts—Half Wages During Disability

The Kansas supreme court holds that while a railroad company could not enter into a general business of writing accident insurance policies, it has the incidental power to embody in its contracts of employment a provision that it will pay partial wages in case of disablement, in consideration of a deduction to be made from each pay check.—*McAdow v. Kansas City Western (Kan.)* 151 Pac. 1113.

Liability of Injury to Freight

The South Carolina supreme court holds that, where fruit was shipped over several connecting lines, and injured by delay in transit, the terminal carrier was liable only for such proportion of the total loss as occurred while the fruit was in its custody; and it was not liable for such proportion of the injury as resulted from the temporizing of the shipper before receiving the fruit.—*Trakas v. Southern Ry. Co. (S. Car.)* 86 S. E. 492.

Johnson Grass—Proof of Source

In an action for damages for the defendant railroad's act in allowing Johnson grass to go to seed on its right of way, there was evidence that Johnson grass on the plaintiff's property might have come from other sources. The Texas Court of Civil Appeals held that the jury was properly charged that the plaintiff was bound to show the amount of his damage caused solely by the defendant's act.—*Missouri, K. & T. v. Forrest (Tex.)*, 179 S. W. 273.

Waiver of Stipulation as to Claims for Damages

A shipper did not present his claim in the form stipulated in the bill of lading, but notified the railroad's general freight agent of the damages to the goods. Negotiations followed without the railroad objecting that the shipper had lost his right because the claim was not made in the proper way. In an action for

damages the Arkansas supreme court holds the railroad had waived its right to object to the manner of presentation of the claim.—*St. Louis, I. M. & S. v. Laser Grain Co. (Ark.)*, 179 S. W. 189.

Notice and Time for Bringing Suit

The Arkansas supreme court holds that where a railroad has established two rates for live stock, one under an unrestricted contract, and the other a lower rate, limiting liability, and the shipper accepts without inquiring the lower rate, it is not necessary, to bind the shipper to the contract, that the agent should call his attention to the higher rate and to expressly offer it to him; and stipulations as to notice and time of bringing suit are not thereby rendered void.—*St. Louis S. W. v. I. W. Haynie & Co. (Ark.)*, 175 S. W. 170.

Assumption of Risk by Employee

The Massachusetts supreme court holds that an experienced foreman of an emergency crew in charge of an electric zone on a railroad, whose contract of employment was to repair defects in the electric wire system, and who knew and appreciated the manifestly dangerous character of the work as well as the company, assumed the risk, and the company owed him no duty, and could not be guilty of negligence or liable for his death while working among the feed wires without first having the power shut off.—*Ashton v. B. & M. (Mass.)*, 109 N. E. 820.

Remedy Under Carmack Amendment Exclusive

The Georgia court of appeals holds that a suit for damages based on the provisions of a Georgia statute cannot be maintained against the last of several connecting carriers, if the loss or damage to the shipment occurred in the course of interstate transportation; for under the provisions of the Carmack amendment the initial carrier alone is liable for damages for interstate shipments, and under the federal regulations of interstate commerce (which supersedes all state regulation upon the same subject) the remedy against the initial carrier is exclusive.—*Southern Ry. Co. v. Bennett (Ga.)* 86 S. E. 418.

Flooding Land—Limitation of Damages

A railroad, by allowing the ditch along its roadbed to become filled up, periodically inundated the adjacent farming lands, depositing gravel and cinders. In an action by the owners of the land the Tennessee Supreme Court holds that the only damages recoverable were those caused by the deposit of gravel within the period of the statute of limitations, taking the value of the land at the beginning of the period as normal, although it was then covered with gravel deposited by previous floodings, as to which the plaintiffs' causes of action were barred.—*Cincinnati, N. O. & T. P. v. Roddy (Tenn.)*, 179 S. W. 143.

Flooding Caused by Construction of Line—Right of Way Purchased from Injured Party

Action was brought for damages for the washing away of a piece of the plaintiff's land and certain fences by the diversion of water from a creek as the result of the construction of a railroad. The railroad had bought the right of way from the plaintiff. The Kentucky Court of Appeals holds that when a right of way is bought by a railroad company, and on this right of way it builds its line, it is only liable to the party from whom it purchased the right of way for negligence in the construction or operation of the road.—*Roberts v. Sandy Valley & Elkhorn (Ky.)*, 179 S. W. 228.

Children as Trespassers in Yards

The switching yards of a railroad were close to a large public school and young children had been in the habit of playing on or near the tracks. One of the children was attracted by some machinery on a car, and climbed up to see it. A string of cars without any lookout on the front was run against the car, and the boy was thrown to the ground, and died from injuries received. In an action for his death the railroad's main contention was that as the boy was a trespasser it was not bound to anticipate his presence, or to use more than ordinary care in the transaction of its business. The Nebraska Supreme Court held

that, ordinarily, this was the proper principle of law; but it held that the circumstance of the proximity of the school took the case out of this rule; ordinary care demands that in switching cars due regard be paid to such conditions. Failure to inclose the tracks and neglect on the part of the switchmen to observe whether children are on the cars or tracks when a train is being backed in, may constitute actionable negligence.—*Krummack v. Missouri Pacific (Neb.)* 154 N. W. 541.

Limitation of Time for Bringing Suit

Live stock was damaged while being held by a railroad company at destination to compel payment of freight charges. In an action for damages the Arkansas supreme court holds that the company had the right to insist that suit for such damages be brought within six months in accordance with a stipulation to that effect in the bill of lading. If the company was entitled to charge the freight demanded it had the right to hold the shipment until it was paid; if it was not, and wrongfully held the shipment, it was still liable for such refusal to deliver as a common carrier, and answerable therefor only in accordance with the stipulation.—*Kansas City Southern v. Bull (Ark.)*, 179 S. W. 172.

Grazing Land—"Speculative Value"

Suit in equity was brought by the Northern Pacific in the Washington courts to compel Benton county to cancel as excessive certain taxes levied on railroad lands. The evidence showed that, as the land is now, it is unfit for any use other than grazing. It is arid land covered with sagebrush, and in part covered with rocks and sand. It has no present sale value other than as spring grazing land for sheep, being too dry to pasture cattle. It was admitted that the land could have no other value, unless something that no one could see, or even define as a probability, existed. It was held by the Washington Supreme Court that the assessment, which appeared to be based on the probable value of the land in the event of a successful system of irrigation, was based on a figure grossly in excess of the value of the land, not at its fair cash value, as the law requires, but at a value not arising even to the dignity of a speculative value; "speculative value" being based on a probability of value within at least the span of a lifetime.—*Northern Pacific v. Benton County (Wash.)* 151 Pac. 1123.

New York Workmen's Compensation Law Sustained

The New York State Court of Appeals, in a suit against the New York Central & Hudson River, decided, this week, that until the Federal government passes a workmen's compensation law, the New York State Workmen's Compensation law applies to railroad employees engaged in interstate commerce.

While tamping ties, plaintiff was struck in the eye by a stone which flew up from the roadbed. The railroad company contended that at the time the man was engaged in interstate commerce and that therefore the Federal employers' liability act measured his right, insisting that there could be no recovery under the Federal law because the injury was a mere accident and not the result of negligence. The contention of the attorney-general was that the compensation law and the Federal statute cannot reasonably be said to cover the same subject matter in view of the different principles that underlie the two statutes, the different purpose sought to be accomplished by them, the restriction of the application of the Federal statute to negligence cases and the broad scope of the state's statute, taking in all industrial accidents, regardless of fault and the different method by which redress is obtained under the two statutes. This view is sustained in the present decision.

The Court of Appeals, Judge Seabury writing the opinion, holds that congress has recognized the differences between these two kinds of statutes and has limited its act to negligence cases and did not intend to enter the field of compensation for industrial accidents, but left that field open for occupancy by the state. Whenever congress shall enter upon this field, all state regulations in conflict with federal authority will be abrogated. The court also holds that the compensation law does not impose any unreasonable condition upon interstate commerce.

A large number of other cases will be affected by this decision. The case will undoubtedly be taken to the United States Supreme Court.

Railway Officers

Executive, Financial, Legal and Accounting

E. A. Merrill, chief clerk in the secretary's office of the Southern Railway, at New York, has been appointed assistant secretary, with office at New York.

F. B. Grier, general solicitor of the Charleston & Western Carolina with office at Greenwood, S. C., has been elected president, succeeding J. B. Cleveland, A. W. Anderson, general manager, Augusta, Ga., has been elected also second vice-president, succeeding J. Kenly.

Elmer A. Howard, whose election as vice-president of the Chicago, Burlington & Quincy, with jurisdiction over the land

and industrial departments, was announced last week, was born at Fairfield, Iowa, on July 18, 1858. He was educated in the public schools and attended the University of Iowa for one year. At the age of 18 he entered the employ of the Burlington as telegrapher and station agent at Fairfield, Iowa, and remained in that position for eight years. In 1885, he entered the Indian service under the Cleveland administration. He resigned as Indian agent in 1887, to go into the banking business at Fairfield, Iowa, and in 1900 was appointed national bank examiner for the state of Iowa. In 1903



E. A. Howard

he returned to the service of the Burlington, and for the past seven years has been real estate and industrial commissioner. Mr. Howard is also chairman of the executive committee of the Chicago Union Station Company.

C. R. Capps, vice-president of the Seaboard Air Line at Norfolk, Va., has been elected first vice-president; W. L. Seddon, first assistant to president, at Norfolk, has been elected vice-president, and W. R. Bonsal, president of the Carolina, Atlantic & Western, also the Charlotte, Monroe & Columbia, has been elected vice-president of the Seaboard Air Line.

J. E. Taussig, whose appointment as assistant to the president of the Wabash has been announced, was born on May 4, 1865, at St. Louis, Mo. He was educated in private schools at London, England; Brussels, Belgium, and Darmstadt, Germany. He entered railway service in 1882 as clerk in the freight office of the St. Louis Bridge & Tunnel Railroad. From 1885 to 1886 he was agent for the Ft. Scott, Wichita & Western; from 1886 to 1887, chief clerk to the general manager of the New York, Providence & Boston; from 1887 to 1888, chief clerk in the office of the trainmaster of the Missouri Pacific, at Wichita, Kan.; from 1888 to 1891, chief train despatcher of the same road, at Winfield, Kan.; from 1891 to 1892, agent of the Wheeling Bridge & Terminal Railway, at Wheeling, W. Va.; from 1892 to May, 1900, superintendent of the same road. From May, 1900, to May, 1901, he held the position of assistant to the general manager of the Wheeling & Lake Erie, at Cleveland, Ohio; from May, 1901, to December, 1904, he was superintendent of telegraph of the same road, at Canton, Ohio; from December, 1904, to February, 1911, superintendent of terminals of the Wabash, at St. Louis, Mo.; from February, 1911, to July, 1912, superintendent of terminals of the Houston & Texas Central and the Galveston, Harrisburg & San Antonio, at Houston, Tex.; and from July, 1912, to July, 1913, superintendent of the Houston division of the latter road. On August 3, 1913, he was appointed special represen-

tative on the staff of E. F. Kearney, first vice-president of the Texas & Pacific, and in September, 1913, was appointed superintendent of transportation for the same road. From July, 1914, to July, 1915, he was general superintendent of the Texas & Pacific, at Dallas, Tex.

Operating

C. S. Lake, general superintendent of the Seaboard Air Line at Norfolk, Va., has been appointed general manager.

H. E. Barber has been appointed chief despatcher of the East St. Louis & Suburban and the Alton, Granite & St. Louis Traction, vice Mr. Hume, resigned, effective November 15.

F. J. DeGrief, trainmaster of the Lake Erie & Western, with headquarters at Lafayette, Ind., has been appointed superintendent of the Peoria division, with headquarters at the same place, succeeding C. C. Arnold, deceased. The office of trainmaster has been abolished.

P. R. Albright, assistant general manager of the Atlantic Coast Line at Wilmington, N. C., has been elected general manager, vice W. N. Royall, resigned on account of ill health; J. N. Brand, general superintendent at Jacksonville, Fla., has been appointed assistant general manager with headquarters at Wilmington; J. C. Murchison, superintendent at Charleston, S. C., has been appointed general superintendent of the Third division with headquarters at Jacksonville; J. P. Walker, assistant superintendent at Charleston, has been appointed superintendent with headquarters at Charleston and T. W. Hansell, assistant superintendent at Sanford, Fla., has been appointed superintendent with headquarters at Sanford.

Traffic

C. E. Emerson has been appointed district freight and passenger agent of the San Pedro, Los Angeles & Salt Lake, with headquarters at Cincinnati, Ohio.

F. D. Hammer, traveling passenger agent of the Wabash at Kansas City, Mo., has been promoted to district passenger agent, with headquarters at Houston, Texas, effective December 1.

Benton M. Bukey has been appointed assistant general passenger agent of the Atchison, Topeka & Santa Fe, with headquarters in Washington, November 6, 1879. He received a high school education, D. C., and entered railroading, W. Va., on Norway service in that city on November 18, 1899, in the accounting department of the Southern. He remained in Washington until July, 1903, when he entered the employ of the Chicago, Burlington & Quincy, in the office of the auditor of ticket accounts, at Chicago, Ill. In November, 1904, he became a rate clerk in the passenger department of the same road, and in April, 1905, went to St. Louis, Mo., to perform the same kind of service for the Missouri Pacific. He was in the service of the Missouri, Kansas & Texas in the same capacity from August, 1906, to October, 1906. Since that time he has been continuously in the passenger department of the Santa Fe at Chicago, Ill. In September, 1908, he was promoted from rate clerk to chief rate clerk, and in September, 1909, was appointed chief clerk to the passenger traffic manager, the position which he held up to the time of his recent promotion.

J. S. Houston, assistant general freight and passenger agent



B. M. Bukey

of the Texas & Pacific and the International & Great Northern, announces the removal of the freight and passenger offices in Chicago, Ill., to suite 415, Marquette building, 140 South Dearborn street.

L. A. Ripley, commercial agent of the Georgia Railroad at Cincinnati, Ohio, has been promoted to general agent, and W. C. Bewley, commercial agent at Jacksonville, Fla., has been transferred to Cincinnati as an assistant to Mr. Ripley.

Frank G. Smith has been appointed district passenger agent of the Chicago Great Western, with headquarters at Cleveland, Ohio, vice Harry L. Wyand, resigned, to engage in other business. Effective November 22.

Albert Kelling, chief clerk in the traffic department of the Oregon-Washington Railroad & Navigation Company, has been appointed assistant general freight agent to succeed J. R. Stein, who resigned a few months ago.

J. C. Ewing, commercial agent of the Ft. Dodge, Des Moines & Southern, at Minneapolis, Minn., has been promoted to assistant general freight and passenger agent, with office in the same city. The office of commercial agent has been abolished.

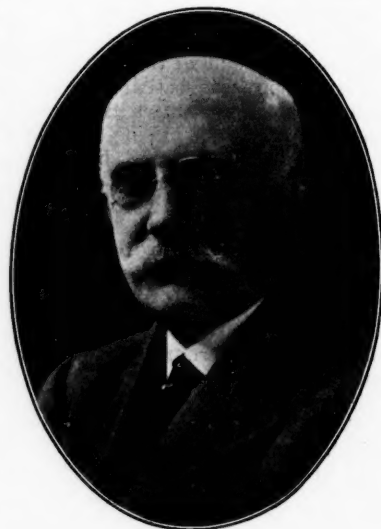
J. L. Park, general freight agent of the St. Louis Southwestern, has assumed the duties formerly discharged by the vice-president in charge of freight traffic, the latter office having been abolished. H. E. Farrell has been vice-president in charge of freight traffic since April 22, 1912. The title of J. D. Watson, heretofore assistant general freight traffic manager, has been changed to assistant general freight agent.

Edwin A. Dawson, manager of the Union Line, will be retired from active work on December 1, under the pension rules of the company, after 53 years of active service with the Pennsylvania system. Mr. Dawson was born at Pittsburgh, Pa., November 22, 1845. He entered the service of the Pittsburgh, Fort Wayne & Chicago in 1862, as a yard clerk at Pennsylvania station, Pittsburgh, and later occupied various clerical positions with that company. In 1864 he became a member of Company B of the 193d Pennsylvania Volunteers. This regiment was detailed for duty along the lines of the Northern Central and Philadelphia, Baltimore & Washington Railways immediately after the Earley raid.

Mr. Dawson re-entered railway service with the Allegheny Valley in 1865, and remained with that line three years, at the end of which time he was made local agent at Pittsburgh. In 1868 he entered the service of the Union Line, then the Union Railroad & Transportation Company, at Pittsburgh. In 1878 he was transferred to Columbus as assistant to D. S. Gray, then western manager of the Union Line. He received his appointment as assistant to western manager on October 1, 1883, and on April 1, 1886, he became western superintendent, with headquarters at Columbus, Ohio. On April 1, 1888, his office was removed to Chicago. On January 1, 1896, Mr. Dawson was appointed acting manager, and on July 15, 1896, he was made manager of the Union Line, with headquarters at Chicago.

Engineering and Rolling Stock

Claude E. Cox, who has been appointed engineer of estimates of the Chicago Union Station Company, was born at Brownstown, Ind., on December 28, 1878. He graduated from high school at Worthington, Ind., and entered railway service in January, 1901. His first position was rodman on the



E. A. Dawson

Indianapolis & Vincennes division of the Pennsylvania Lines West; later he was appointed senior of the corps for the Indianapolis terminals, at Indianapolis, Ind. In November, 1904, he was appointed engineer in charge of location and construction for the Duluth, St. Cloud, Glencoe & Mankato, now a subsidiary of the Chicago, Milwaukee & St. Paul, in southern Minnesota. In December, 1905, he was appointed assistant engineer in the office of the district engineer of the St. Paul, at Minneapolis, Minn. In January, 1910, he was transferred to Aberdeen, S. D., where he was assistant engineer in charge of the construction of engine and passenger terminals. He came to the Chicago office of the St. Paul in January, 1912, where he was assigned to valuation work, and shortly afterward appointed assistant valuation engineer, a position which he held up to the time of his recent appointment as engineer of estimates for the Union Station Company.

J. H. Weed, maintenance of way inspector of the St. Louis & San Francisco, has been appointed roadmaster of the River and Cape division. C. R. Gray, Jr., maintenance of way inspector, has been appointed roadmaster of the Western division. H. R. Irvine, inspector maintenance of way, has also been appointed roadmaster for the Western division.

Purchasing

James L. Woods, whose appointment to the position of purchasing agent of the Nashville, Chattanooga & St. Louis with headquarters at Nashville, Tenn., has been announced in these columns, was born at Belfast, Tenn., December 9, 1875.



J. L. Woods

He was educated in the common schools at that place and later attended the Haynes McLean school at Lewisburg, Tenn., and the Winchester Normal School at Winchester, Tenn. In the spring of 1897 he entered the service of the Nashville, Chattanooga & St. Louis as a clerk in the general passenger department. From the early part of 1898 to October 1 of that year he was a clerk in the division superintendent's office at Tullahoma, Tenn. From October, 1898, to

February 12, 1914, he served in various clerical capacities in the Atlanta freight agency at Atlanta, becoming chief clerk. From that position he was promoted to the position of assistant purchasing agent at Nashville.

A. J. Sweing, chief clerk to the purchasing agent of the Wabash, has been appointed general storekeeper, with headquarters at St. Louis, Mo. This is a newly-created office.

C. H. Rothgary, assistant storekeeper of the Baltimore & Ohio at Cleveland, Ohio, has been appointed storekeeper at Lorain, Ohio, vice H. J. Cobb, resigned. W. D. Francis has been appointed assistant storekeeper at Cleveland to succeed Mr. Rothgary.

OBITUARY

C. C. Arnold, superintendent of the Peoria division of the Lake Erie & Western, at Lafayette, Ind., died at his home in that city on November 15.

RAILWAY ACCIDENTS IN THE UNITED KINGDOM.—If the number of passengers killed in the Quintinshill accident be accepted as 225, the number killed in train accidents during the present year is 252: Ilford, January 1, 10; Kinsale, January 28, 2; Smithy Bridge, March 18, 3; Quintinshill, May 22, 225; Pollokshaws, August 14, 1; Weedon, August 14, 10; Newark, September 6, 1. In 1889, 88 passengers were killed, including 80 in the Armagh accident.—*The Engineer, London.*

Equipment and Supplies

LOCOMOTIVE BUILDING

THE SOUTHERN is in the market for a number of locomotives.

THE TAVARES & GULF is in the market for 2 ten-wheel locomotives.

THE WAYNESBURG & WASHINGTON is contemplating the purchase of one freight locomotive.

THE ST. PAUL UNION DEPOT has ordered 2 switching locomotives from the Lima Locomotive Corporation.

THE CINCINNATI, INDIANAPOLIS & WESTERN which recently ordered 35 locomotives has issued inquiries for 5 ten-wheel locomotives.

THE OAHU RAILWAY & LAND COMPANY, Honolulu, Hawaii, has ordered one ten-wheel, one Consolidation type and one six-wheel switching locomotives from the American Locomotive Company.

THE ARTHUR IRON MINING COMPANY, St. Paul, Minn., reported in the issue of October 22 as being in the market for 8 locomotives, has ordered 8 switching locomotives from the Lima Locomotive Corporation.

NEW YORK, NEW HAVEN & HARTFORD.—President Howard Elliott, in an address before the Boston Art Club on November 20, outlined needed betterments to the road to cost \$32,000,000, including \$9,100,000 for 300 all-steel passenger train cars, 100 steam locomotives and 3,000 freight cars. Just when this equipment apparently would be acquired by the New Haven, however, was not apparent.

THE ELGIN, JOLIET & EASTERN has ordered 18 superheater Mikado and 9 eight-wheel superheater switching locomotives from the American Locomotive Company. The Mikado locomotives will have 28 by 30-in. cylinders, 63-in. driving wheels and a total weight in working order of 307,000 lb. The switching locomotives will have 24 by 28-in. cylinders, 51-in. driving wheels and a total weight in working order of 217,000 lb.

THE PENNSYLVANIA LINES WEST, reported in the *Railway Age Gazette* of November 12 as being in the market for 50 freight locomotives, has ordered 48 superheater Consolidation locomotives from the American Locomotive Company and 15 of the same type from the Lima Locomotive Corporation. Of these 63 locomotives, 50 will be used by the Pennsylvania Company, 10 by the Vandalia and 3 by the Grand Rapids & Indiana. The locomotives ordered from the American Locomotive Company will have 26 by 28-in. cylinders, 62-in. driving wheels and a total weight in working order of 253,000 lb. each. The report in the issue of November 12 that the Pennsylvania Lines West had ordered 53 locomotives from the Lima Locomotive Corporation and 10 from the American Locomotive Company was incorrect.

CAR BUILDING

NEW YORK, NEW HAVEN & HARTFORD.—See item under Locomotive Building.

THE KANSAS CITY SOUTHERN is inquiring for prices on 200 gondola car bodies.

THE SOUTHERN RAILWAY is reported to be in the market for a large number of cars.

THE CANADIAN PACIFIC will build 250 refrigerator cars in its own shops at Montreal.

THE ERIE has ordered 13 all-steel suburban coaches from the Pressed Steel Car Company.

THE LONG ISLAND has issued inquiries for 6 parlor cars, 10 baggage cars and 25 trailer coaches.

THE CHICAGO & ALTON has ordered 150 composite gondola car bodies from the Haskell & Barker Car Company.

THE MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE RAILWAY

has ordered 200 50-ton ore cars from the American Car & Foundry Company.

THE BUTTE, ANACONDA & PACIFIC has ordered one combination mail and baggage car from the American Car & Foundry Company.

THE CALUMET & ARIZONA MINING COMPANY is inquiring for one caboose car, 2 box cars, 4 flat cars, one coach and one combination coach.

DENVER & RIO GRANDE. The report in last week's issue to the effect that this company is in the market for 1,000 box cars has been denied.

THE DELAWARE, LACKAWANNA & WESTERN has ordered two dining cars from the Pullman Company and 500 hopper cars from the American Car & Foundry Company.

THE MONONGAHELA CONNECTING is inquiring for prices on 65 120-ton drop bottom gondola cars, 10 100-ton flat cars and 25 to 50 40-ton coke cars.

THE NASHVILLE, CHATTANOOGA & ST. LOUIS will build 500 40-ton box cars in its own shops in addition to the 500 reported in the *Railway Age Gazette* of October 15.

THE MISSOURI, KANSAS & TEXAS is inquiring for prices on 500 general service cars in addition to the 2,000 composite gondola cars reported in the *Railway Age Gazette* of November 12.

THE MONTGOMERY RAILROAD reported in an unconfirmed item in the issue of November 12 as having ordered 800 steel car bodies from the Standard Steel Car Company ordered but 400 steel car bodies from that company.

THE WESTERN MARYLAND was reported in an unconfirmed item in last week's issue as having increased its order for hopper cars recently given the Pullman Company from 2,000 to 3,000. This item has since been confirmed.

THE INTERBOROUGH RAPID TRANSIT, reported in the *Railway Age Gazette* of November 12, as being in the market for 311 all-steel subway cars, has ordered 234 motor car bodies and 77 trailer car bodies from the Pullman Company.

THE CINCINNATI, INDIANAPOLIS & WESTERN, reported in last week's issue as having ordered 650 freight cars from the Haskell & Barker Car Company, ordered 450 40-ton box cars; 50 40-ton stock cars; 40 40-ton flat cars; 50 50-ton gondola cars; 50 50-ton hopper cars and 20 caboose cars from that company.

THE NEW YORK MUNICIPAL will soon place orders for an additional 100 subway cars for the Sea Beach Line. These cars will bring the total number of cars ordered by this company to 400, the 300 cars previously ordered having been obtained from the American Car & Foundry Company on three different orders.

IRON AND STEEL

THE NORFOLK & WESTERN has ordered 12,000 tons of rails from the Carnegie Steel Company.

THE CINCINNATI, INDIANAPOLIS & WESTERN has ordered 1,500 tons of bridge material from the American Bridge Company.

THE NORTHERN PACIFIC has ordered 20,000 tons of rails from the Illinois Steel Company, the Lackawanna Steel Company and the Bethlehem Steel Company.

NEW YORK SUBWAYS. Bids for the supply of special work for the Lexington avenue subway from its junction with the existing subway at the Grand Central Station, New York, to One Hundred and Thirty-eighth street, in the borough of the Bronx, will be received by the Public Service Commission for the First district on December 7. The special work called for includes all frogs, switches and cross-overs for the line, comprising 19 separate pieces.

SIGNALING

THE CHICAGO, INDIANAPOLIS & LOUISVILLE is to install mechanical interlocking at the crossing of its line with the Grand Trunk at Haskells, Ind. The machine will have 24 levers and the distant signals will be power operated.

Supply Trade News

Harry D. Rohman, who was recently appointed chief electrical engineer of the Franklin Railway Supply Company, New York, was born in Switzerland in 1883. Upon his graduation



Harry D. Rohman

as an electrical engineer from the technical schools of Zurich, he entered the works of the Oerlikon Electrical Construction Company. There he was afforded an opportunity of combining a practical training with the theory of engineering, and in 1903 qualified as an electrical engineer, with experience in high and low tension and A. C. and D. C. work, especially electrical traction. Later he entered the service of J. Stone & Co., London, and gradually worked up through its various departments until in 1910 he was appointed chief of the testing and experimental

departments. In April, 1914, he was appointed chief assistant electrical engineer, and held that position until October 1, 1915, when he entered the service of the Franklin Railway Supply Company as noted above. Mr. Rohman speaks several languages and has had an extensive experience in all European countries, including the Balkan states, and in South Africa and the Belgian Congo.

L. T. Burwell, formerly with the M. W. Supply Company, Philadelphia, Pa., has become associated with the Q & C Company, New York.

J. M. Spangler, formerly with the Railroad Supply Company, Chicago, has recently entered the service of the National Carbon Company, Cleveland, Ohio.

W. H. Crawford has been appointed Pacific coast representative of the Simmen Automatic Railway Signal Company, Buffalo, N. Y. Mr. Crawford will have offices at 609 Spalding building, Portland, Ore.

G. C. Pool, formerly with Guilford S. Wood, Chicago, and previous to that with the Acme Supply Company, Chicago, has become connected with the Q & C Company, New York. His attention will be given particularly to Q & C devices for locomotives and cars.

James Forgie, a consulting engineer of New York has been awarded the Telford gold medal by the Institution of Civil Engineers ((Great Britain) in recognition of his paper on "The Laxaxalpam Aqueduct Tunnels in Mexico" and his achievements in engineering. Mr. Forgie has been prominently identified with the solution of rapid transit problems in cities, having been engaged on the Pennsylvania and Hudson & Manhattan tubes in New York, the underground railways of London and other tunneling and subaqueous construction work.

The Roberts & Schaefer Company has been awarded a contract by the Oregon-Washington Railroad & Navigation Company for the immediate installation of a 250-ton two-track reinforced concrete standard counterbalanced bucket locomotive coaling plant at Pilot Rock Junction, Ore. This plant will have automatic coal handling machinery, and will be arranged with equipment to weigh all coal passing to locomotives. The contract price is \$17,500. The company has also been authorized by the Chicago Great Western to build at Council Bluffs, Iowa, a duplicate of

the fireproof standard counterbalanced locomotive bucket coaling plant with automatic operation, which has been installed at Clarion, Iowa, making the fifth plant of this type installed by the Roberts & Schaefer Company for this road. The contract price of the latter is \$10,300.

Isaac M. Cate, a large stockholder, has renewed his attack on the organization and management of the American Locomotive Company by sending first to the directors and now to the other stockholders a 58-page printed letter reciting the findings of his accountants and other details. Mr. Cate first attacked the management of the company in February, 1912, directing his efforts against Waldo H. Marshall, president, and a number of other officers particularly. The board authorized an inquiry of Mr. Cate's charges of mismanagement, waste and misconduct, but the report of the committee of inquiry did not support Mr. Cate. In September, 1914, Sylvanus L. Schoonmaker was elected chairman of the board. This appeased Mr. Cate for a time, but not for long. Mr. Cate in his present letter seeks to discount the ability of the present management of the company. Concerning its war orders, he says: "Those in your company who did not make automobiles at a profit or develop the superheater or build locomotives in competition with the Baldwins are not the men to extract profits from shrapnel shells. The contract for shells was taken on April 15, with everything laid out for speedy preparations. There have been nearly six months of preparation. If the production of shells is subject to such prodigious cost as my accountant finds pervades the organization it will not be possible to compete with other institutions."

TRADE PUBLICATIONS

SIMPLEX LETTERING TEMPLATES.—The Keuffel & Esser Company, New York, has issued a leaflet describing its transparent dylonite templates for lettering, engineering and architectural drawing, etc. The templet contains two holes with perforations of different sizes by means of which the letters of the alphabet and numerals may be spaced correctly and outlined. Glass and Payzant pens suitable for use with these templates are also described.

TWO NEW REELS.—Keuffel & Esser Company, New York, has issued a leaflet describing a four-arm folding reel for use with tapes or flat chains $\frac{1}{4}$ in. wide and from 100 to 500 ft. long. Its advantage lies in the fact that it may be folded when not in use, and carried in the pocket. The Colorado steel reel is also described and is intended for tapes from 100 to 600 ft. long, up to 5/16 in. wide. It has a long folding handle, which locks into an opening at either end of the frame, and thus prevents the tape from unwinding.

LUBRICATING DEVICES.—The Richardson-Phenix Company, Milwaukee, Wis., has recently issued bulletins Nos. 50 and 60 dealing, respectively, with the Phenix force feed lubricator and the Richardson Model "M" sight feed oil pump. The former booklet contains a complete description of the Phenix ratchet type lubricator and also describes the new Model "T" device. Illustrations are given showing the construction and operation of the lubricators. Bulletin No. 60 relates to the Model "M" lubricator. Interesting illustrations show the process of manufacture from the raw material to the finished lubricators on the test rack and give a good idea of the manner in which the pumps are drilled and milled from a solid block of cast iron. Other items of interest are a description of the new Richardson air spray attachment, and the steam and electric attachments for heating the oil in the lubricator reservoir.

BRITISH LOCOMOTIVE EXPORTS.—There was a slight improvement in British locomotive exports in September, the value of the shipments for the month having been about \$1,454,500, as compared with \$1,439,590 in September, 1914, and \$1,395,525 in September, 1913. The improvement was due to an increase in the value of the deliveries to the Argentine Republic during the month to \$118,720, as compared with \$34,855 and \$274,775. South Africa imported locomotives in September to the value of \$189,330, as compared with \$64,105 and \$133,185, but there was a great falling off in the deliveries to India and Australia.

Railway Construction

AMERICUS, HAWKINSVILLE & EASTERN.—Work on the remaining sections of this line from Games, Ga., to Hawkinsville, 27 miles, and from Flint river to Americus, 18 miles, is now under way. J. S. Morton, Byromville, Ga., is the contractor. The company was organized to build from Americus, Ga., northeast to Hawkinsville, 55 miles. (September 24, p. 585.)

ATLANTIC COAST LINE.—Work is now under way on a connection between the Monticello branch and the Fanlew branch, Fla., 1.3 miles; contract for the work has been let to J. F. Lamb, Thomasville, Ga. The company is also building an extension of the Hollywood spur in South Carolina, south about 4.5 miles; contract let to W. Z. Williams & Co., Macon, Ga.

BAY POINT & CLAYTON.—This company is building an extension from Cowell, Cal., to Clayton, 2.5 miles. The company now operates a line from Bay Point, Cal., to Cowell, 10 miles.

BELLINGHAM & NORTHERN.—This company plans to build an extension from Goshen, Wash., to Welcome, 11 miles. The company now operates a line from Bellingham, Wash., to Glacier, 44 miles.

CHARLES CITY WESTERN ELECTRIC.—This company has completed work on an extension from Charles City, Ia., to Colwell, eight miles.

ELECTRIC SHORT LINE.—On the line building from Winsted, Minn., west to Hutchinson, 45 miles, grading on a section of 18.25 miles is expected to be finished in about ten days. Track laying is now under way from Winsted west and the company expects to have the new extension in operation by January, 1916. In addition, about 2.5 miles of side track and track for a Y at a Hutchinson is expected to be finished. On the line now in operation from Minneapolis to Winsted, 60 miles, about 4 miles of side tracks, mostly at terminals in Minneapolis, Lyndale, Watertown, Hazleton and Winsted were laid in 1915. During 1916 the company expects to build about 50 miles of new line. (Sept. 10, p. 487.)

FORT DODGE, DES MOINES & SOUTHERN (ELECTRIC).—Work is now under way on a six-mile section from Swanwood Junction, Iowa, to Des Moines. (August 13, p. 1301.)

FORT WORTH BELT.—This company is now building 2 miles of team tracks at Fort Worth, Tex.

HETCH HETCHY.—This company has grading work finished on 9 miles of the line building from Rosasco, Cal., on the Sierra Railway to Hetch Hetchy dam site, 67 miles. The work is being carried out by the Utah Construction Company. M. M. O'Shaughnessy, San Francisco, Cal., may be addressed. (See San Francisco Roads, Nov. 5, p. 879.)

MATTAWAMKEAG & NORTHERN.—Financial arrangements have been made, it is said, for the construction of a line from Mattawamkeag, Me., northwest via East Millinocket to Millinocket, 23 miles. A charter to build the line has been given to C. W. Mullen and I. B. Wood, of Bangor; A. Weatherbee, Lincoln, and F. J. Rich, Mattawamkeag. Stone & Webster, of Boston, Mass., are the fiscal agents, and have already made a survey for this line.

MEXICO & SANTA FE (ELECTRIC).—This company has been incorporated in Missouri to operate an electric railway from Mexico, Mo., to a point in Monroe county, 16 miles distant. The incorporators are: J. A. Botts, W. W. Mundy, M. W. Beamer and J. P. Cauthorn, of Molino, Mo., and T. C. Botts, J. D. Bates and W. W. Botts, of Mexico. The construction of the road has been practically completed.

NEW YORK SUBWAY.—The contract for track-laying on the new rapid transit lines in the borough of Queens has been awarded by the New York Public Service Commission, First District, to the Thomas Crimmins Contracting Company, the lowest bidders, for \$204,898. The contract includes the extension of the Queensboro subway from its present terminus at Jackson and Van Alst avenues, in Queens, to the Queensboro bridge plaza; the elevated railroad from the Queensboro bridge

plaza northward to Ditmars avenue, Astoria, and the elevated railroad from the Queensboro bridge plaza northeasterly to Alburtis avenue, Corona.

NORFOLK, WASHINGTON & NEW YORK.—Organized to build from Newport News, Va., to Washington, D. C., 159 miles, with a branch down the Northern neck, 50 miles long. Surveys and estimates have been completed and the right of way is about secured. The company expects to begin construction work in the near future. Channing M. Ward, president, Richmond, Va.

PHILADELPHIA ROADS.—Bids are wanted by A. M. Taylor, director of city transit at Philadelphia, Pa., for the following work: On December 7, for the concrete column foundations and piers for about 4,000 linear ft. of a two-track elevated railway in Frankford avenue from Unity street to Dyre street, Philadelphia, Pa. Bids are wanted on December 14 for the steel superstructure and appurtenant work for a two-track elevated railway in Frankford avenue from Unity street to Dyre street, comprising about 4,000 linear ft. of structure. (October 29, 1915, p. 828.)

PINE BLUFF & NORTHERN.—This company plans to build an extension from Cullor, Ark., to Pine Bluff, 35 miles. The company now operates an 8-mile line from McCreanor to Cullor.

QUEBEC CENTRAL.—This railroad has projected an extension from English Lake, Que., to a point in the township of Dionne, L'Islet county, about 25 miles.

ROACH TIMBER COMPANY'S LINES.—Grading work has been finished on five miles of the line projected east from Sutherlin, Ore. The company will probably begin grading work in the near future on an additional section. W. L. Roach, president, Muscatine, Iowa. (October 22, p. 779.)

SUTHERLIN, COOS BAY & EASTERN.—The company has finished the survey and partially graded the line from Sutherlin, Ore., to Hinkle Creek, 14 miles. The delay in securing the necessary right of way, and the general condition of the lumber market at present does not encourage carrying on the work. It is expected that construction work on the line will be carried out next spring. J. F. Luse, Sutherlin, may be addressed.

TIDEWATER SECURITIES CORPORATION.—Grading work has been finished on the line building from Alabama Port, Ala., to Cedar Point, 3.2 miles. T. W. Nichol, chief engineer, Mobile. (April 2, p. 768.)

WATAUGA & YADKIN RIVER.—Surveys are now being made for an 8-mile extension to be built between Darby, N. C., and Rogers Mills.

WAUSHARA COUNTY.—This company is building with its own forces from Red Granite, Wis., to Pay Sippi, over 8 miles. Grading has been finished on six miles. A. L. Christofferson, president, Pay Sippi, Wis.

RAILWAY STRUCTURES

ALLENTOWN, PA.—The Central of New Jersey has given a contract to the Pennsylvania Steel Company, Steelton, Pa., for fabricating and erecting the steel superstructure of new bridges to be built over the Lehigh river at Allentown. The improvements include 3 double track, deck plate girders, with ballasted floors, each span to be 90 ft. long. The work calls for 500 tons of steel and 1,300 cu. yd. of concrete for the piers. The estimated cost of the improvements will be \$52,500. Bids for the masonry piers have not yet been asked for.

AURORA, ILL.—A fire, the origin of which is not known, destroyed a warehouse belonging to the Chicago, Burlington & Quincy on November 13. The gross loss, including the structure and contents, has been estimated at \$150,000. A temporary storehouse has already been secured by the company, and plans for a new building are now being prepared.

BEAUMONT, TEX.—The Texarkana & Ft. Smith will open bids on a new passenger depot on November 27. It will be a one-story, stucco structure, 46 ft. by 223 ft., with tile roof, steam heat and electric lighting. C. E. Johnston, chief engineer, 510 Kansas City Southern Railway building, Kansas City, Mo.

Railway Financial News

ALABAMA, TENNESSEE & NORTHERN.—On application of the Guaranty Trust Company representing a bondholders' committee, the United States District Court at Mobile, Ala., Judge Toulmin, on Monday of this week appointed John T. Cochrane, of Mobile, and M. W. Thompson, of New York, receivers for this property. Mr. Cochrane is president of the road and Mr. Thompson is president of the Railway Development Corporation, a holding company which has been organized to represent New York interests. The line of the road extends from Reform, Ala., southward 185 miles to Calvert, Ala., 34 miles north of Mobile. The security holders have a plan for extending the road northward from Reform to an intersection with the St. Louis & San Francisco. The company has outstanding in bonds \$3,882,000, in notes \$1,235,000 and in car trust certificates \$180,000.

ST. LOUIS & SAN FRANCISCO.—Further details have been given out of the plan for the reorganization of this company. The reorganized company will take over all the mileage of the old company (including the Kansas City, Fort Scott & Memphis lease), with the exception of the New Orleans, Texas & Mexico and the Chicago & Eastern Illinois.

The mileage of the new system, upon which the new bond issue will be secured, is 3,852.76 miles of first track and 1,009.16 miles of second and side track; total, 4,861.92 miles. To this may be added, in case of acquisition, the Quanah, Acme & Pacific mileage, 80.80 miles. The reorganization plan provides for:

Prior liens undisturbed, 5s-6s, due 1931.....	\$9,484,000
New issue of prior lien mortgage bonds.....	250,000,000
Cumulative adjustment mortgage bonds, maturing July 1, 1955.....	75,000,000
Income mortgage bonds, maturing July 1, 1960 authorized	75,000,000
<i>Capital Stock</i>	
Preferred stock 6 per cent redeemable at 100, authorized	200,000,000
Common stock, authorized.....	250,000,000
<i>Securities to be Presently Issued</i>	
<i>Prior lien mortgage bonds, viz.:</i>	
In partial exchange for existing securities embraced in the plan.....	93,398,500
Sold to purchase syndicate.....	25,000,000
For the corporate purposes of the new company....	6,811,500

Total	\$125,210,000
Balance reserved for future requirements under restrictions of mortgage.....	\$124,790,000
The outstanding prior lien mortgage bonds shall be as follows:	
\$93,398,500, series "A," 4 per cent, maturing July 1, 1950, redeemable at 100 and accrued interest; \$31,811,500, series "B," 5 per cent, maturing July 1, 1950, redeemable at 105 and accrued interest.	

<i>Cumulative Adjustments Gold Bonds</i>	
Rate not to exceed 6 per cent, as may be determined at time of issue:	
In partial exchange for the existing securities embraced in plan.....	\$40,545,737
(To be designated as series "A" 6 per cent, due July 1, 1955, callable at 100.)	
Reserved for future use under restrictions of mortgage	34,454,263

<i>Income Mortgage Gold Bonds</i>	
To be issued in exchange for existing securities....	38,661,200
(Designated as series "A" 6 per cent convertible, maturing July 1, 1960, redeemable at 100.)	
Reserved for future use under restrictions of mortgage	36,338,800

Total	\$75,000,000
Reserve bonds may be issued with interest not to exceed 6 per cent per annum, to be determined by board at time of issue.	

Rate per mile of new securities to be presently issued: Prior lien mortgage 4s and 5s, \$27,700; cumulative adjustment 6s, \$8,400; noncumulative income mortgage 6s, \$8,000. Total, \$44,100.	
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Preferred stock, \$1,450; common stock, \$10,900. Total, \$12,350.	
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Total capitalization, bonds and stock, \$56,450.	
Capital stock to be presently issued: Preferred stock, 6 per cent, redeemable at 100, \$7,000,000; balance reserved for conversion of income bonds, \$75,000,000; reserved for future corporate uses, \$118,000,000.	

Common stock to be presently issued, \$53,000,000; reserved for corporate uses, \$197,000,000.	
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The preferred and common stock is to be in the hands of the voting trustees for five years. The purchasing syndicate—Speyer & Co., J. & W. Seligman & Co., the Guaranty Trust Company, New York, and Lee Higginson & Co.—is to receive a commission of 4 per cent on the amount of the syndicate obligation of \$25,000,000.

ANNUAL REPORTS

CHICAGO, BURLINGTON & QUINCY RAILROAD COMPANY—SIXTY-FIRST ANNUAL REPORT

Chicago, July 1, 1915.

To the Stockholders of the Chicago, Burlington & Quincy Railroad Company:

The following is the report of your Board of Directors for the year ended June 30, 1915:

CHICAGO, BURLINGTON & QUINCY RAILROAD COMPANY.
YEARS ENDED JUNE 30.

Per Cent	1915	OPERATING REVENUES	1914	Per Cent
68.60	\$62,509,483.62	Freight revenue	\$62,799,188.01	67.03
22.15	20,185,564.28	Passenger revenue	21,743,507.05	23.21
2.70	2,464,372.90	Mail revenue	2,428,503.50	2.59
2.39	2,176,214.07	Express revenue	2,595,965.75	2.77
		Miscellaneous transportation revenue	2,116,560.32	2.26
2.08	1,893,988.61	Revenue from operations other than transportation	1,876,995.40	2.00
1.98	1,805,801.76	Joint facility	126,421.03	.14
.10	89,635.43			
100.00	\$91,125,060.67	Total operating revenue	\$93,687,141.06	100.00

OPERATING EXPENSES

Per Cent	1915	OPERATING EXPENSES	1914	Per Cent
12.47	\$11,360,210.26	Maintenance of way and structures	\$12,010,977.42	12.82
16.92	15,415,122.75	Maintenance of equipment	16,035,205.02	17.12
1.79	1,629,673.95	Traffic expenses	1,634,672.43	1.75
31.95	29,117,163.60	Transportation expenses	30,224,523.90	32.26
.91	832,153.90	Miscellaneous operations	921,586.39	.98
2.29	2,087,040.58	General expenses	2,397,887.66	2.56
66.33	\$60,441,367.04	Total operating expenses	\$63,224,852.82	67.49
33.67	\$30,683,693.63	Net operating revenue	\$30,462,288.24	32.51
	\$4,081,507.88	Railway tax accruals	\$4,016,657.74	
	24,157.35	Uncollectible railway revenues		
	\$4,105,665.23		\$4,016,657.74	
	\$26,578,028.40	Operating income	\$26,445,630.50	

OTHER INCOME

	\$879,286.07	Rents	\$879,286.07
	389,994.77	Miscellaneous interest	415,072.02
	\$1,224,069.41	Total other income	\$1,294,358.09
	\$27,802,097.81	Gross corporate income	\$27,739,988.59

DEDUCTIONS FROM GROSS CORPORATE INCOME

\$1,549,474.44	Rents	\$1,765,669.73
24,032.26	Miscellaneous interest	128,707.50
7,118,898.27	Interest accrued on funded debt	6,981,650.49
55,010.56	Discount on funded debt	44,516.16
12,762.86	Miscellaneous debits	12,242.74
\$8,760,178.39	Total deductions	\$8,932,786.62
\$19,041,919.42	Net corporate income	\$18,807,201.97
\$1,753,006.79	Sinking funds	\$1,692,794.83
8,867,128.00	Dividends	8,867,128.00
3,340,669.28	Appropriations for additions and betterments	5,715,875.07
\$13,960,804.07		\$16,275,797.90
\$5,081,115.35	Surplus for the year	\$2,531,404.07

NOTE.—The arrangement of the above table is in accordance with the new Interstate Commerce Commission form. This required that the figures, as presented in the 1914 report, be revised. Necessarily this revision has been general in its nature.

CAPITALIZATION
CAPITAL STOCK

Number of Shares	Total Par Value Authorized and Outstanding	Dividends Declared the Year	During
1,108,391	\$110,839,100.00	Rate 8%	Amount \$8,867,128.00

FUNDED DEBT

Nominally Issued	Actually Issued	Interest Accrued During Year
Reacquired	Actually Outstanding	on Bonds "Actually Outstanding."
In Treasury	In Treasury Pledged	In Sinking Funds
\$9,873,000	\$1,098,600	\$31,000
	\$21,850,400	\$181,690,000
		\$7,118,898.27

MILEAGE

MILEAGE OF ROAD OPERATED ON JUNE 30, 1915

STATE	Line Owned	Operated Under Lease	Total Line Operated
Illinois	1,671.58	112.89	1,784.47
Iowa	1,365.12	73.44	1,438.56
Missouri	1,122.30	13.15	1,135.45
Wisconsin	222.49	.53	223.02
Minnesota	23.61	14.84	38.45
Nebraska	2,850.34	22.37	2,872.71
Kansas	259.32	.82	260.14
Colorado	394.36	34.97	429.33
South Dakota	279.95		279.95
Wyoming	684.96	34.98	719.94
Montana	134.38	49.54	183.92
Total	9,008.41	357.53	9,365.94

LINE OWNED

STATE	Single Track	Second Track	Third Track	Yard and Sidings	Total
Illinois	1,671.58	360.36	42.40	941.54	3,015.88
Iowa	1,365.12	244.53		337.50	1,947.15
Missouri	1,122.30	107.22		439.12	1,668.64
Wisconsin	222.49	113.87		77.09	413.45
Minnesota	23.61	2.25		37.10	62.96
Nebraska	2,850.34	17.96		700.54	3,568.84
Kansas	259.32			24.23	283.55
Colorado	394.36			137.41	531.77
South Dakota	279.95			61.57	341.52
Wyoming	684.96			182.23	867.19
Montana	134.38			33.74	168.12
Total	9,008.41	846.19	42.40	2,972.07	12,869.07

TAXES

	1915	1914	Increase or Decrease
Illinois	\$ 927,813.36	\$ 916,308.10	Inc. \$ 11,505.26
Iowa	528,151.13	511,005.43	Inc. 17,145.70
Missouri	399,978.10	396,164.54	Inc. 3,813.56
Wisconsin	264,906.08	239,746.19	Inc. 25,159.89
Minnesota	31,568.25	32,481.93	Dec. 913.68
Nebraska	1,073,568.13	1,049,459.83	Inc. 24,108.30
Kansas	67,244.30	69,804.97	Dec. 2,560.67
Colorado	240,223.06	207,830.02	Inc. 32,393.04
South Dakota	108,817.83	92,831.92	Inc. 15,985.91
Wyoming	208,903.24	228,122.67	Dec. 19,219.43
Montana	61,330.50	57,858.55	Inc. 3,471.95
Other States	305.56	183.82	Inc. 121.74
Total States	\$3,912,809.54	\$3,801,797.97	Inc. \$111,011.57
United States Government	\$ 168,698.34	\$ 214,859.77	Dec. \$ 46,161.43
Grand Total	\$4,081,507.88	\$4,016,657.74	Inc. \$ 64,850.14

TRAFFIC AND OPERATING STATISTICS

ITEM	1915	1914	Increase or Decrease
	Dollars and Whole Numbers	Dollars and Whole Numbers	Dollars and Whole Numbers
	Cents and Decimals	Cents and Decimals	Cents and Decimals
PASSENGER TRAFFIC			
Numbers of passengers carried earning revenue	22,708,392	23,445,911	Dec. 737,519
Number of passengers carried one mile	1,079,264,875	1,152,123,930	Dec. 72,859,055
Number of passengers carried one mile, per mile of road	115,561	126,058	Dec. 10,497
Average distance carried, miles	47	49	Dec. 1
Total passenger revenue	\$20,185,564	\$21,743,507	Dec. \$1,557,942
Average amount received from each passenger	88890	92739	Dec. 3849
Average receipts per passenger per mile	01870	01888	Dec. 00018
Total passenger service train revenue	\$25,457,027	\$27,443,201	Dec. \$1,986,174
Passenger service train revenue per mile of road	\$2,725	\$3,002	Dec. \$276
Passenger service train revenue per train mile	\$1 38800	\$1 47134	Dec. 08334
FREIGHT TRAFFIC			
Number of tons carried of freight earning revenue	31,758,791	32,388,800	Dec. 630,009
Number of tons carried one mile	8,527,444,254	8,612,629,607	Dec. 85,185,353
Number of tons carried one mile per mile of road	913,068	942,339	Dec. 29,271
Average distance haul of one ton, miles	268	265	Inc. 2
Total freight revenue	\$62,509,483	\$62,799,188	Dec. \$289,704
Average amount received for each ton of freight	\$1 96826	\$1 93892	Inc. 02934
Average receipts per ton per mile	00733	00729	Inc. 00004
Freight revenue per mile of road	\$6,693	\$6,871	Dec. \$177
Freight revenue per train mile	\$3 60408	\$3 48951	Inc. 11457

MILEAGE STATISTICS

ITEM	1915 Miles	1914 Miles	Increase or Decrease Miles
LOCOMOTIVE MILEAGE—Revenue Service.			
Freight locomotive miles.....	17,895,430	18,700,800	Dec. 805,370
Passenger locomotive miles.....	17,972,865	18,164,766	Dec. 191,901
Mixed locomotive miles.....	862,287	936,243	Dec. 73,956
Special locomotive miles.....	28,926	20,026	Inc. 8,900
Switching locomotive miles.....	9,719,358	9,779,536	Dec. 60,178
Total	46,478,866	47,601,371	Dec. 1,122,505
Locomotive mileage—non-revenue service	1,560,931	1,826,016	Dec. 265,085
CAR MILEAGE—Revenue Service.			
Freight car mileage:			
Loaded	443,389,629	451,470,933	Dec. 8,081,304
Empty	215,800,636	212,332,776	Inc. 3,467,860
Caboose	16,734,933	17,132,686	Dec. 397,753
Total	675,925,198	680,936,395	Dec. 5,011,197
Passenger car mileage:			
Passenger	46,061,646	47,548,623	Dec. 1,486,977
Sleeping, parlor and observation.	27,842,218	27,219,853	Inc. 622,365
Other passenger train cars.....	41,025,476	42,270,155	Dec. 1,244,679
Total	114,929,340	117,038,631	Dec. 2,109,291
Car mileage in special service:			
Freight, loaded.....	209,953	175,643	Inc. 34,310
Freight, empty.....	16,411	5,857	Inc. 10,554
Caboose	21,685	17,939	Inc. 3,746
Passenger	76,718	58,123	Inc. 18,595
Sleeping, parlor and observation.	8,097	.....	Inc. 8,097
Other passenger train cars.....	4,796	1,571	Inc. 3,225
Total	337,660	259,133	Inc. 78,527
Total car mileage—revenue service	791,192,198	798,234,159	Dec. 7,041,961
Car mileage—revenue service... ..	4,349,836	6,637,427	Dec. 2,287,591
TRAIN MILEAGE—Revenue Service.			
Freight train.....	16,490,454	17,065,955	Dec. 575,501
Passenger train.....	17,487,156	17,721,174	Dec. 234,018
Mixed train.....	853,620	930,638	Dec. 77,018
Special train.....	25,339	18,879	Inc. 6,460
Total train mileage—revenue service	34,856,569	35,736,646	Dec. 880,077
Train mileage—non-revenue service	829,327	1,043,727	Dec. 214,400

EQUIPMENT

ITEMS	Number on June 30, 1914	Number Added During Year	Number Retired During Year	Number on June 30, 1915	Average Tractive Power All Locomotives and Freight Cars
Steam locomotives:					
Passenger	444	7	15	436	.....
Freight	919	35	36	918	.....
Switching	410	14	41	383	.....
Total locomotives	1,773	35	71	1,737	30,808 lbs.
Freight-train cars:					
Box cars.....	30,958	1,001	1,941	30,018	.....
Flat cars.....	1,572	.....	18	1,554	.....
Stock cars.....	7,534	370	225	7,679	.....
Coal cars.....	21,800	1,251	50	23,001	.....
Tank cars.....	213	.....	.....	213	.....
Refrigerator cars.....	2,997	.....	28	2,969	.....
Caboose cars.....	686	25	24	687	.....
Other freight-train cars.. ..	83	.....	3	80	.....
All classes of freight-train cars.....	65,843	2,647	2,289	66,201	40.67 tons

Passenger-train cars:

Coaches	667	1	2	666	.....
Combination passenger cars	145	1	3	143	.....
Other combination cars.. ..	108	.....	1	107	.....
Dining cars.....	14	.....	.....	14	.....
Parlor cars.....	14	.....	.....	14	.....
Baggage and express cars.	196	16	2	210	.....
Postal cars.....	73	.....	20	53	.....
Other passenger-train cars.	41	.....	1	40	.....
All classes of passenger-train cars	1,285	18	29	1,274	.....
Company service cars:					
Officers and pay cars.....	32	1	.....	33	.....
Ballast cars.....	2,781	.....	153	2,628	.....
Derrick cars.....	24	3	2	25	.....
Steam shovels.....	21	.....	3	18	.....
Wrecking cars.....	17	.....	.....	17	.....
Other company service cars	2,774	84	250	2,608	.....
All classes of company service cars.....	5,649	88	408	5,329	.....
All classes of cars in service	72,777	2,753	2,726	72,804	.....
Floating equipment:					
Steamboats and tugboats.	1	.....	.....	1	.....
Barges, car floats and canal boats.....	38	.....	1	37	.....
Other floating equipment.. ..	2	.....	.....	2	.....
Total floating equipment.	41	.....	1	40	.....

FREIGHT TRAFFIC MOVEMENT—ENTIRE LINE.
COMPANY MATERIAL EXCLUDED

COMMODITIES	Originating on this Road Tons	Received from Connections Tons	Total Freight Tonnage Tons Per Cent.
Products of Agriculture:			
Grain	4,029,737	604,769	4,634,506 14.60
Flour	538,373	151,955	690,328 2.17
Other mill products.....	204,399	54,230	258,629 .81
Hay	251,430	165,699	417,129 1.31
Tobacco	2,998	916	3,914 .01
Cotton	2,793	43,286	46,079 .15
Fruits and vegetables.....	422,550	853,106	1,275,656 4.02
Other products.....	118,329	104,899	223,228 .70
Total	5,570,609	1,978,860	7,549,469 23.77
Products of Animals:			
Live stock.....	1,526,940	230,217	1,757,157 5.53
Dressed meats.....	154,558	8,783	163,341 .51
Other packing house products	127,692	8,975	136,667 .43
Poultry, game and fish.....	66,961	25,739	92,700 .29
Wool	6,349	5,009	11,358 .04
Hides and leather.....	16,433	4,806	21,239 .07
Other products.....	66,088	31,121	97,209 .31
Total	1,965,021	314,650	2,279,671 7.18
Products of Mines:			
Anthracite coal.....	22,756	194,549	217,305 .68
Bituminous coal.....	7,572,284	1,841,098	9,413,382 29.64
Coke	24,119	110,501	134,620 .43
Ores	90,854	290,443	381,297 1.20
Stone, sand, etc.....	1,633,330	298,815	1,932,145 6.08
Other products.....	105,778	236,786	342,564 1.08
Total	9,449,121	2,972,192	12,421,313 39.11
Products of Forests:			
Lumber	212,116	1,375,916	1,588,032 5.00
Other products.....	117,239	122,758	239,997 .76
Total	329,355	1,498,674	1,828,029 5.76
Manufactures:			
Petroleum and other oils....	251,861	334,382	586,243 1.85
Sugar	174,338	144,370	318,708 1.00
Naval stores.....	8,609	3,681	12,290 .04

TRAFFIC AND OPERATING STATISTICS—(Continued)

ITEM	1915		1914		Increase or Decrease	
	Dollars and Whole Numbers	Cents and Decimals	Dollars and Whole Numbers	Cents and Decimals	Dollars and Whole Numbers	Cents and Decimals
OPERATING						
Operating revenues	\$91,125,060	67	\$93,687,141	06	Dec.	\$2,562,080 39
Operating revenues per mile of road.....	\$9,757	13	\$10,250	65	Dec.	\$493 52
Operating revenues per train mile.....	\$2	61429	\$2	62160	Dec.	\$671 00731
Operating expenses	\$60,441,367	04	\$63,224,852	82	Dec.	\$2,783,485 78
Operating expenses per mile of road.....	\$6,471	70	\$6,917	66	Dec.	\$445 96
Operating expenses per train mile.....	\$1	73400	\$1	76919	Dec.	\$3519 03519
Net operating revenue	\$30,683,693	63	\$30,462,288	24	Inc.	\$221,405 39
Net operating revenue per mile of road.....	\$3,285	43	\$3,332	99	Dec.	\$47 56
Net operating revenue per train mile.....	88029	.....	85241	.....	Inc.	02788
Average number of passengers per car mile.....	15	.....	15	.....	.....	.....
Average number of passengers per train mile.....	59	.....	62	.....	Dec.	3
Average number of passenger cars per train mile.....	6	27	6	27	.....	.....
Average number of tons of freight per loaded car mile.....	19	23	19	08	Inc.	15
Average number of tons of freight per train mile.....	491	66	478	57	Inc.	13 09
Average number of freight cars per train mile.....	38	97	37	84	Inc.	1 13
Average number of loaded freight cars per train mile.....	25	56	25	09	Inc.	47
Average number of empty freight cars per train mile.....	12	44	11	80	Inc.	64
Average mileage operated during year.....	9,339	33	9,139	63	Inc.	199 70

* Including cabooses.

Manufactures: (Continued)

Iron, pig and bloom.....	5,710	76,373	82,083	.26
Iron and steel rails.....	6,992	36,557	43,549	.13
Other castings and machinery.....	114,218	181,120	295,338	.93
Bar and sheet metal.....	39,021	185,145	224,166	.71
Cement, brick and lime.....	1,340,982	432,187	1,773,169	5.58
Agricultural implements.....	143,497	65,093	208,590	.66
Wagons, carriages, tools, etc.....	30,898	57,112	88,010	.28
Wines, liquors and beers.....	123,895	41,219	165,114	.52
Household goods, etc.....	140,830	72,160	212,990	.67
Other manufactures.....	404,254	495,145	899,399	2.83
Total	2,785,105	2,124,544	4,909,649	15.46
Merchandise.....	1,509,568	662,473	2,172,041	6.84
Miscellaneous.....	463,560	135,059	598,619	1.88
Total tonnage	22,072,339	9,686,452	31,758,791	100.00

EXPENDITURES FOR NEW LINES AND EXTENSIONS, FOR EQUIPMENT AND FOR ADDITIONS AND BETTERMENTS DURING THE YEAR

ACCOUNT	New Lines and Extensions	Charged to Road and Equipment	Charged to Income	Total Expenditure
Engineering.....	\$ 16,104.81		\$ 22,615.26	\$ 38,720.07
Land for transportation purposes.....	Cr. 42,280.67	\$2,399,107.01		2,356,826.34
Grading.....	534,580.98		254,078.15	788,659.13
Tunnels and subways.....	237,010.04			237,010.04
Bridges, trestles and culverts.....	206,070.68		334,462.04	540,532.72
Ties.....	179,598.56		78,143.26	257,741.82
Rails.....	305,743.68		325,244.16	630,987.84
Other track material.....	60,466.06		351,940.62	412,406.68
Ballast.....	91,177.81		88,486.53	179,664.34
Track laying and surfacing.....	152,844.05		142,989.56	295,833.61
Right-of-way fences.....	11,941.17		9,776.77	21,717.94
Snow and sand fences and snow sheds.....	6,335.06			6,335.06
Crossings and signs.....	7,293.76		82,862.01	90,155.77
Station and office buildings.....	Cr. 300,186.39		240,733.31	Cr. 59,453.08
Roadway buildings.....	6,894.04		Cr. 2,460.00	4,434.04
Water stations.....	62,615.69		53,982.75	116,598.44
Fuel stations.....	1,168.73		11,470.39	12,639.12
Shops and engine houses.....	1,982.62		42,054.57	44,037.19
Wharves and docks.....	Cr. 1.44		10,135.23	10,133.79
Telegraph and telephone lines.....	17,841.39		21,178.46	39,019.85
Signals and interlockers.....	1,510.80		160,264.93	161,775.73
Miscellaneous structures.....	1,712.92		15,677.28	17,390.20

Paving.....		\$6,896.27	\$6,896.27
Roadway machines.....	2.25	1,611.25	1,613.50
Roadway small tools.....	153.75		153.75
Assessments for public improvements.....		124,048.01	124,048.01
Other expenditures.....		43.50	208,296.74
—Road.....	208,253.24		
Shop machinery.....		11,621.45	11,621.45
Power plant machinery.....		10,665.37	10,665.37
Total expenditures for road	\$1,768,833.59	\$2,399,107.01	\$2,398,521.13
Steam locomotives.....		\$ 536,662.36	\$ 536,662.36
Freight-train cars.....		632,820.70	632,820.70
Passenger-train cars.....		Cr. 6,949.63	Cr. 6,949.63
Floating equipment.....		405.48	405.48
Work equipment.....		Cr. 220,836.76	Cr. 220,836.76
Total expenditures for equipment		\$ 942,102.15	\$ 942,102.15
Law	\$ 30.16	\$ 46.00	\$ 76.16
Total general expenditures	\$ 30.16	\$ 46.00	\$ 76.16
Grand total	\$1,768,863.75	\$2,399,107.01	\$3,340,669.28

During the year the line extending southerly from Laurel, Mont., has been completed to Orin Junction, Wyo.; and the connection between Guernsey and Wendover should be ready for operation by December 1st of this year. The building of these tracks completes a line from Northport, Neb., to Billings, Mont., 532 miles in length, which will soon be an important line in the operations of the Company in that territory, as well as being a part of the plan for a low grade line between the Missouri River and Billings.

\$378,549.53 has been expended for second track, and there have been placed in operation during the year 104.58 miles of main track, 13.31 miles of second track and 55.93 miles of other tracks.

Heavy and continuing rains during the early summer caused floods which did considerable damage, particularly in parts of Wyoming, Kansas, Nebraska, Missouri, Illinois and Iowa, necessitating heavy expenditures in the month of June; and like conditions extended into July and August of this year.

A bridge across the Ohio River at Metropolis, Ill., is in process of construction by the Paducah & Illinois R. R. Co., a company whose capital stock is owned by your Company and the Nashville, Chattanooga & St. Louis Ry. Co. This new bridge will enable your Company to better compete, with other north and south lines, for business to and from the south.

The complete reconstruction of the bridge across the Missouri River at Kansas City is well under way and will probably be completed in 1916. The old bridge was built in 1868-69 and is single tracked. The new bridge will be a double tracked, thoroughly modern, steel structure on concrete piers.

The new Kansas City Terminal Railway plant, with its passenger station and extensive passenger and freight facilities, was opened on November 1,

GENERAL BALANCE SHEET.

June 30, 1915.

ASSETS.			
Investments:			
Property investment—Road and equipment:			
Road.....	\$363,307,390.87		
Equipment.....	77,853,368.11		
General expenditures.....	174,270.28		\$441,335,029.26
Sinking funds:			
Book assets.....	\$21,723,505.99		
Par value of Company's own issues included.....	21,850,400.00	Cr.	126,894.01
Deposits in lieu of mortgaged property sold.....			44,631.05
Miscellaneous physical property.....			1,449,557.01
Investments in affiliated companies:			
Stocks.....	\$27,574,645.01		
Bonds.....	1,590,622.93		
Advances.....	5,620,503.06		\$34,785,771.00
Other investments:			
Stocks.....	\$24,067.91		
Bonds.....	165,498.00		
Notes.....	97,187.18		
Miscellaneous.....	3,035.00		289,788.09
Total investments			\$477,777,882.40
Current assets:			
Cash.....	\$7,123,451.12		
Time deposits.....	10,000.00		
Loans and bills receivable.....	4,084,420.59		
Traffic and car-service balances receivable.....	809,841.31		
Net balance receivable from agents and conductors.....	2,501,597.65		
Miscellaneous accounts receivable.....	2,537,892.58		
Material and supplies.....	7,171,219.92		
Total current assets			\$24,238,423.17
Deferred assets:			
Working fund advances.....	\$23,202.91		
Other deferred assets.....	1,000.00		
Total deferred assets			\$24,202.91
Unadjusted debits:			
Insurance premium paid in advance.....	\$148,096.36		
Discount on funded debt.....	2,353,658.84		
Other unadjusted debits.....	2,043,138.94		
Total unadjusted debits			\$4,544,894.14
Grand total			\$506,585,402.62

LIABILITIES.	
Capital stock:	
Common stock.....	\$110,839,100.00
Long term debt:	
Bonds held by the public.....	\$181,690,000.00
Bonds held by trustees, account sinking funds.....	21,850,400.00
Bonds owned by the Company, unpledged.....	10,971,600.00
Bonds owned by the Company, pledged.....	31,000.00
Total	\$214,543,000.00
Less bonds held by or for the Company, included in above.....	32,853,000.00
Total long term debt	\$181,690,000.00
Current liabilities:	
Traffic and car-service balances payable.....	\$1,807,328.31
Audited accounts and wages payable.....	6,047,293.04
Miscellaneous accounts payable.....	309,367.71
Interest matured unpaid.....	1,689,945.00
Dividends matured unpaid.....	445.25
Funded debt matured unpaid.....	6,000.00
Unmatured interest accrued.....	1,118,246.66
Other current liabilities.....	442,477.49
Total current liabilities	\$11,421,103.46
Unadjusted credits:	
Tax liability.....	\$95,310.00
Insurance reserves.....	1,206,830.01
Operating reserves.....	565,000.00
Accrued depreciation—Equipment.....	30,583,344.86
Other unadjusted credits.....	1,325,963.54
Total unadjusted credits	\$33,776,448.41
Corporate surplus:	
Additions to property since June 30, 1907, through income.....	\$30,486,904.50
Funded debt retired through income.....	14,642,465.38
Sinking fund reserves.....	22,108,870.97
Appropriated surplus not specifically invested.....	3,740,856.09
Profit and loss.....	97,879,653.81
Total corporate surplus	\$168,858,750.75
Grand total	\$506,585,402.62

1914. It was constructed by the Kansas City Terminal Railway Company, an organization consisting of all of the important Kansas City lines.

The Denver Union Terminal Railway, which is used by all the railroads of that city, is being remodeled and upon completion will be a thoroughly modern terminal.

The Chicago Union Station Co. has been organized by your Company, the Pennsylvania Lines and the Chicago, Milwaukee & St. Paul Ry. Work preparatory to the construction of a modern passenger terminal in Chicago has been begun and the structure, when completed, will not only avoid the serious congestion of the present station, by furnishing ample room for present needs, but will also allow for expansion of business in the future.

Other passenger stations and freight depots have been constructed where required.

The ruling grade between Chicago and Aurora has been reduced to .3%, which will result in more economical handling of tonnage rated freight trains between Mendota and Chicago and avoid reduced tonnage east of Aurora.

Following is the report of the General Auditor, with statements prepared by him.

By order of the Board of Directors.

HALE HOLDEN, President.

INCOME ACCOUNT.

OPERATING INCOME.

Railway operating revenues:	
Transportation:	
Freight	\$62,509,483.62
Passenger	20,185,564.28
Excess baggage	249,332.41
Parlor and chair car	4,650.40
Mail	2,464,372.90
Express	2,176,214.07
Other passenger train	8,710.32
Milk	368,183.16
Switching	1,217,513.31
Special service train	45,749.01
Other freight train	Dr. 150.00
\$89,229,623.48	
Incidental:	
Dining and buffet	\$ 601,974.05
Hotel and restaurant	71,143.06
Station and train privileges	7,585.62
Parcel room	12,721.88
Storage—Freight	35,585.35
Storage—Baggage	17,885.57
Demurrage	265,540.27
Telegraph and telephone	236,907.76
Stock yards	238,934.97
Rent of bldgs. & other prop.	134,589.06
Miscellaneous	182,034.17
\$ 1,805,801.76	
Joint facility—Cr.	\$ 105,327.09
Joint facility—Dr.	15,691.66
\$ 89,635.43	
Total railway operating revenues	\$91,125,060.67

Railway operating expenses:

Maintenance of way and structures	\$ 11,360,210.26
Maintenance of equipment	15,415,122.75
Traffic expenses	1,629,675.95
Transportation expenses ..	29,117,163.60
Miscellaneous operations ..	832,153.90
General expenses	2,087,040.58
\$60,441,367.04	

Net revenue from railway operations

\$ 4,081,507.88

24,157.35

4,105,665.23

Total operating income.

\$26,578,028.40

NONOPERATING INCOME:

Hire of equipment	\$ 202,472.80
Joint facility rent income ..	505,493.50
Income from lease of road ..	3,070.71
Miscellaneous rent income ..	140,704.35
Miscellaneous nonoperating property	Dr. 17,666.72
Dividend income	18,895.84
Income from funded securities	40,880.67
Income from unfunded securities and accounts ..	327,854.18
Income from sinking funds ..	2,364.08
\$1,224,069.41	

Gross income

\$27,802,097.81

DEDUCTIONS FROM GROSS INCOME:

Hire of equipment	\$ 333,098.58
Joint facility rents	1,154,170.68
Rent for leased roads	21,702.82
Miscellaneous rents	40,502.36
Miscellaneous tax accruals ..	12,751.31
Interest on funded debt	7,118,898.27
Interest on unfunded debt ..	24,032.26
Amortization of discount on funded debt	55,010.56
Miscellaneous income charges ..	11.55
8,760,178.39	

Net income

\$19,041,919.42

DISPOSITION OF NET INCOME:

Income applied to sinking funds	\$ 1,753,006.79
Dividend appropriations of income:	
2 per cent Sept. 25, 1914 ..	\$ 2,216,782.00
2 per cent Dec. 26, 1914 ..	2,216,782.00
2 per cent March 25, 1915 ..	2,216,782.00
2 per cent June 25, 1915 ..	2,216,782.00
Income appropriated for investment in physical property ..	3,340,669.28
\$13,960,804.07	
Income balance transferred to profit and loss	\$ 5,081,115.35

FUNDED DEBT OF THE CHICAGO, BURLINGTON & QUINCY RAILROAD COMPANY

Designation of Bond of Obligation.	Term.		Nominally Outstanding, Held by or for Company.						Interest.		
	Date of Issue.	Date of Maturity.	Total Par Value Authorized.	Total Nominally or Actually Outstanding.	In Treasury.	Pledged as Collat- eral.	In Sinking Funds.	Actually Outstanding In Hands of Public.	Rate.	When Payable.	Accrued During Year on Bonds Actually Outstanding.
MORTGAGE BONDS											
C. B. & Q. R. R.:											
General mortgage.....	Mar. 2, 1908	Mar. 1, 1958	\$ 75,120,000	\$ 75,120,000	\$ 9,873,000			\$ 65,247,000	4	M. & S.	\$2,608,546.66
Illinois Division.....	July 1, 1899	July 1, 1949	50,835,000	50,835,000	384,000			50,451,000	3½	J. & J.	1,765,785.00
Illinois Division.....	July 1, 1899	July 1, 1949	34,165,000	34,165,000	189,000			33,976,000	4	J. & J.	1,359,040.00
Iowa Division mort- gage sinking fund bonds.....	Oct. 1, 1879	Oct. 1, 1919	3,000,000	1,960,000	16,000			1,944,000	5	A. & O.	99,259.59
Iowa Division mort- gage sinking fund bonds.....	Oct. 1, 1879	Oct. 1, 1919	12,502,000	5,265,000	180,000			5,085,000	4	A. & O.	210,013.64
Nebraska extension mortgage sinking fund bonds.....	May 1, 1887	May 1, 1927	29,441,000	21,639,000	89,000	\$31,000		21,519,000	4	M. & N.	869,910.76
B. & M. R. R. in Nebraska:											
Consolidated mortgage sinking fund bonds..	July 1, 1878	July 1, 1918	13,751,000	13,613,000	53,400		\$12,052,400	1,507,200	6	J. & J.	118,051.49
Republican Valley R. R.:											
Mortgage sinking fund bonds.....	July 1, 1879	July 1, 1919	1,078,000	932,800			857,400	75,400	6	J. & J.	6,684.04
Tarkio Valley R. R.:											
Mortgage bonds.....	June 1, 1880	June 1, 1920	210,000	19,000	1,000			18,000	7	J. & D.	1,452.50
Nodaway Valley R. R.:											
Mortgage bonds.....	June 1, 1880	June 1, 1920	188,000	17,000	3,000			14,000	7	J. & D.	1,300.84
Collateral Trust Bonds.											
C. B. & Q. R. R.:											
Sinking fund bonds (Denver Extension).	Dec. 1, 1881	Feb. 1, 1922	7,968,000	7,310,200	131,200		5,745,600	1,433,400	4	F. & A	60,084.32
PLAIN BONDS											
C. B. & Q. R. R.:											
Sinking fund bonds....	Sept. 1, 1881	Sept. 1, 1921	4,300,000	3,667,000	52,000		3,195,000	420,000	4	M. & S.	18,769.43
Total			\$232,558,000	\$214,543,000	\$10,971,600	\$31,000	\$21,850,400	\$181,690,000			\$7,118,898.27

COLORADO & SOUTHERN RAILWAY COMPANY—SIXTEENTH ANNUAL REPORT

To the Stockholders of the Colorado & Southern Railway Company:

Herewith is submitted the Sixteenth Annual Report of this Company, for the year ended June 30, 1915.

There are included the reports of A. D. Parker, Vice-President, and J. H. Bradbury, General Auditor.

By order of the Board of Directors,

HALE HOLDEN,
President.

MR. HALE HOLDEN,
President,
Chicago, Ill.

DEAR SIR:—I herewith submit the report for the fiscal year ended June 30, 1915, which report combines the operations and affairs of the lines operated by the companies named on the previous page, and which are herein designated as the

"COLORADO & SOUTHERN LINES"

Per Cent.	1915.	OPERATING REVENUES	1914.	Per Cent.
70.69	\$ 9,960,043.59	Freight Revenue.....	\$ 9,053,885.00	68.47
23.38	3,294,688.32	Passenger Revenue.....	3,345,489.44	25.30
1.66	234,206.23	Mail Revenue.....	226,844.16	1.72
1.64	230,757.01	Express Revenue.....	260,598.66	1.97
1.91	269,503.51	Misc. Transportation Rev..	252,452.15	1.91
		Revenue from Operations		
		other than		
.61	85,159.65	Transportation	76,933.03	.58
.11	16,157.47	Joint Facilities.....	6,534.92	.05
100.00	\$ 14,090,515.78	Total Operating Revenue..	\$ 13,222,737.36	100.00
OPERATING EXPENSES				
		Maintenance of Way and		
12.26	\$ 1,728,253.99	Structures	\$ 1,818,146.33	13.75
19.10	2,691,585.14	Maintenance of Equipment..	2,184,784.04	16.52
1.53	215,445.89	Traffic Expenses.....	216,445.43	1.64
34.64	4,881,074.01	Transportation Expenses..	5,055,015.62	38.23
3.52	494,489.13	General Expenses.....	471,611.16	3.57
71.05	\$ 10,010,848.16	Total Operating Expenses..	\$ 9,746,002.58	73.71
28.95	\$ 4,079,667.62	Net Operating Revenue..	\$ 3,476,734.78	26.29
	17,565.12	Net Deficit from Outside	16,956.19	
	\$ 4,062,102.50	Total Net Revenue.....	\$ 3,459,778.59	
	\$ 616,053.40	Taxes Accrued.....	\$ 638,450.24	
	483.02	Uncollectible R'y Revenue..		
	\$ 616,536.42		\$ 638,450.24	
	\$ 3,445,566.08	Operating Income.....	\$ 2,821,328.35	
OTHER INCOME				
	\$ 285,063.62	Rents	\$ 262,487.79	
	172,811.84	Miscellaneous Interest...	627,915.08	
	\$ 457,875.46	Total Other Income....	\$ 890,402.87	
	\$ 3,903,441.54	Gross Corporate Income..	\$ 3,711,731.22	
DEDUCTIONS FROM GROSS CORPORATE INCOME				
	\$ 363,730.30	Rents	\$ 177,662.85	
	5,631.02	Miscellaneous Interest...	817.01	
	2,842,249.47	Interest Accrued on Funded	2,853,001.18	
		Department		
	14,143.27	Extinguishment of Discount	10,300.80	
	61,382.56	on Securities Sold.....	61,029.76	
	62,538.37	Sinking Funds.....	202,768.49	
	\$ 3,349,674.99	Miscellaneous Deductions..	\$ 3,305,580.09	
	\$ 553,766.55	Total Deductions.....	\$ 406,151.13	
		Net Corporate Income....	340,265.84	
	\$ 553,766.55	Dividends	\$ 65,885.29	
		Surplus		

Compared with the preceding year, the total operating revenues show an increase of \$867,778.42, or 6.56%. The operating expenses show an increase of \$264,845.58, or 2.71%. The net operating revenue shows an increase of \$602,932.84, or 17.34%.

Adjustment in tax accruals makes the taxes show a decrease of \$22,396.84, or 3.50%. The taxes as assessed and paid, however, differed little from the previous year.

Operating Income shows an increase of \$624,237.73, or 22.12%. The percentage of operating revenues required for operating expenses was 71.05%, as compared with 73.71% in the previous year. It required 72.81% of the Gross Corporate Income to meet interest on funded debt this year, as compared with 76.86% in the previous year.

Credits to Other Income on account of Miscellaneous interest show a decrease of \$455,103.24. This is due to the fact that this Company received no interest during the year on their investment in securities of the Trinity & Brazos Valley Railway Company.

As reflected on pages 17 and 19 there was appropriated from surplus \$1,000,000.00 to establish a reserve to provide for possible losses arising out of the depreciation in value of the securities of certain railroads owned by The Colorado and Southern Railway Company.

During the fiscal year the following securities have been issued and added to the Long Term Debt of these Companies:

Fort Worth & Denver City Railway Company Equipment Trust, Series C..... \$1,120,000.00

and the following Long Term Debt obligations have been retired:

First Mortgage Bonds of C. S. & C. C. D. Ry. Co. through Sinking Fund	\$ 58,000.00
Deferred Rentals under Equipment Leases.....	273,226.18
Making net increase in Long Term Debt of.....	\$ 788,773.82

There were charges to capital account aggregating \$1,110,895.63 for Additions and Betterments to property. Of this amount there was expended for:

Structures and Machinery.....	\$ 16,380.41
Substituting permanent bridges for wooded ones.....	40,302.26
Laying tie plates, main line.....	59,700.55
Additional Equipment	954,555.37
Various other Additions and Betterments.....	39,957.04

New equipment purchased and placed in service during the year included:

Five Santa Fe Type automatic stoking and superheated locomotives of 73,440 pounds tractive power each.
Ten Mikado Type oil-burning, superheated locomotives of 52,300 pounds tractive power each.
1,200 40-foot steel center-sill box cars, forty-ton capacity.
300 40-foot steel center-sill stock cars, forty-ton capacity.
200 steel gondola coal cars, fifty-ton capacity.

During the year a number of spur tracks and industry tracks were abandoned as they were of no further service to the Company, and credits equal to the original cost of the property were passed to the various Additions and Betterments accounts.

The following equipment was condemned and credited to Property Account:

Sixteen steam locomotives, five passenger train cars, six hundred fifty-nine freight train cars and seventeen work cars.

During the fiscal year there was credited to Property Account the Discount on Securities of this Company sold between July 1, 1909, and June 30, 1910.

During the year the movement of Products of Agriculture has shown a substantial gain, both in respect to the tonnage moved and the revenue received.

Products of Animals show a slight decrease.

The tonnage and revenue from Products of Mines have not returned to the normal capacity, and still show a considerable decrease from what this Company was accustomed to handle in previous years. The total tonnage handled and the total freight revenue received show a substantial increase over the previous year. Present prospects would indicate an increased tonnage of both Products of Mines and Products of Agriculture over the lines of this Company's property during the next year.

It was noted last year that the property of The Trinity & Brazos Valley Railway Company was placed in the hands of a Receiver on June 16, 1914, and was operated during the year by such Receiver. His operating results show a net operating revenue of \$49,594.24, against which net revenue, taxes and miscellaneous items were charged, creating a net deficit to Income for the twelve months of \$42,626.96.

A recent contract has been made by the Receiver whereby he will be able to operate freight trains between Fort Worth and Waxahachie over the Houston & Texas Central Railway, making a direct connection at Fort Worth with the Colorado & Southern Lines. This, it is believed, will increase the earnings of the Receiver.

The following statistical tables have been compiled in the form required for the annual report of carriers to the Interstate Commerce Commission:

INCOME STATEMENT.

JUNE 30, 1915.

Transportation:			
OPERATING REVENUES.			
Freight	\$9,960,043.59		
Passenger	3,294,688.32		
Excess Baggage	29,021.09		
Mail	234,206.23		
Express	230,757.01		
Other Passenger Train....	1,504.79		
Switching	231,924.38		
Special Service Train	6,862.16		
Other Freight Train.....	191.09	\$13,989,198.66	
Incidental:			
Dining and Buffet.....	\$ 79,640.70		
Hotel and Restaurant....	2,821.35		
Station and Train Privileges	18,408.60		
Parcel Room	1,141.56		
Storage Freight	2,383.68		
Storage Baggage	4,244.19		
Demurrage	45,857.17		
Rent of Buildings and			
Other Property	5,557.71		
Miscellaneous	7,566.74	\$ 167,621.70	
Joint Facilities:			
Joint Facilities—Cr.....	\$ 16,179.70		
Joint Facilities—Dr.....	22.23	\$ 16,157.47	
Total Operating Revenues.		\$14,172,977.83	
OPERATING EXPENSES.			
Maintenance of Way and			
Structures	\$1,741,313.17		
Maintenance of Equipment..	2,723,291.50		
Traffic Expenses.....	215,497.05		
Transportation Expenses....	4,908,457.99		
Miscellaneous Operations....	81,225.01		
General Expenses.....	441,090.61	\$10,110,875.33	
Net Operating Revenue..		\$ 4,062,102.50	
Railway Tax Accruals.....	\$ 616,053.40		
Uncollectible Railway Revenue	483.02	\$ 616,536.42	
Operating Income.....		\$ 3,445,566.08	

INCOME STATEMENT—(Continued)

OTHER INCOME.	
Income from Lease of Road.	\$ 239,702.82
Joint Facility Rent Income.	24,550.20
Miscellaneous Rent Income.	20,810.60
Separately Operated Properties Profit.	1,233.24
Dividend Income.	8,133.00
Income from Funded Securities.	113.87
Income from Other Securities and Accounts.	39,192.45
Miscellaneous Income.	124,139.28
	\$ 457,875.46
Gross Income.	\$ 3,903,441.54
DEDUCTIONS FROM GROSS INCOME.	
Hire of Equipment—Balance.	\$ 303,856.48
Joint Facility Rent Deductions.	45,253.91
Miscellaneous Rent Deductions.	14,619.91
Interest Deductions for Funded Debt.	2,842,249.47
Other Interest Deductions.	5,631.02
Amortization of Discount on Funded Debt.	14,143.27
Separately Operated Properties—Loss.	29,125.06

Miscellaneous Deductions.	\$33,413.31	\$ 3,288,292.43
Net Income.		\$ 615,149.11

DISPOSITION OF NET INCOME.

Appropriations of Income to Sinking Funds.	\$ 61,382.56
Income Balance Transferred to Profit and Loss.	\$ 553,766.55

PROFIT AND LOSS STATEMENT.

PROFIT AND LOSS STATEMENT.		
Credit:		
Balance June 30, 1914.....	\$ 2,655,451.65	
Balance for Year brought forward from Income Account	\$ 553,766.55	
Profit from Sale of Investment Securities	263,934.00	
Miscellaneous Credits.....	135,691.51	\$ 3,608,843.71
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Debit:		
Appropriations of Surplus...	\$ 1,391,652.06	
Miscellaneous Debits.....	254,617.47	1,646,269.53
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Balance Credit June 30, 1915		\$ 1,962,574.18

GENERAL BALANCE SHEET.

JUNE 30, 1915.

ASSETS.		LIABILITIES.	
Investments:		Capital Stock:	
Investment in Road and Equipment.	\$110,954,697.89	Common Stock.	\$ 31,021,484.00
Sinking Funds.	412.57	Preferred Stock.	17,000,000.00
Deposits in lieu of Mortgage Property Sold.	13,035.40		
Miscellaneous Physical Property.	4,710.00	Total Stock.	\$ 48,021,484.00
Investments in Affiliated Companies:		Long Term Debt:	
Stocks.	\$ 446,228.21	Funded Debt Unmatured—	
Bonds.	10,200,498.05	Total Book Liability.	\$68,113,346.55
Advances.	18,995.88	Held by Carrier.	5,218,446.55
	10,665,722.14	Actually Outstanding.	\$ 62,894,900.00
Other Investments:		Current Liabilities:	
Stocks.	\$ 1,021,610.30	Traffic and Car Service Balances Payable.	334,186.49
Advances.	413,477.44	Audited Accounts and Wages Payable.	1,048,843.52
	1,435,087.74	Miscellaneous Accounts Payable.	1,752.95
Total Investments.	\$123,073,665.74	Interest Matured Unpaid.	84,445.00
Current Assets:		Dividends Matured Unpaid.	214.60
Cash.	\$ 1,561,710.79	Unmatured Interest Accrued.	627,988.39
Special Deposits.	85,812.73	Unmatured Rents Accrued.	4,743.30
Loans and Bills Receivable.	7,850.00	Other Current Liabilities.	30,863.81
Traffic and Car Service Balances Receivable.	271,403.21		
Net Balance Receivable from Agents and Conductors.	165,803.67	Total Current Liabilities.	\$ 2,133,038.06
Miscellaneous Accounts Receivable.	304,340.96	Deferred Liabilities:	
Material and Supplies.	1,227,006.98	Other Deferred Liabilities.	\$ 10,853.98
Rents Receivable.	20,871.42		
Other Current Assets.	6,387.98	Unadjusted Credits:	
Total Current Assets.	\$ 3,651,187.74	Tax Liability.	\$ 463,168.56
Deferred Assets:		Accrued Depreciation—Equipment.	3,919,526.77
Working Fund Advances.	\$ 1,037.73	Other Unadjusted Credits.	80,855.11
Other Deferred Assets.	30,104.15		
Total Deferred Assets.	\$ 31,141.88	Total Unadjusted Credits.	\$ 4,463,550.44
Unadjusted Debits:		Corporate Surplus:	
Rents and Insurance Premiums Paid in Advance.	\$ 17,786.55	Additions to Property through Income or Surplus.	\$ 6,208,571.39
Discount on Funded Debt.	299,380.94	Funded Debt Retired through Income or Surplus.	402,000.00
Other Unadjusted Debits.	55,435.75	Sinking Fund Reserves.	31,626.55
Securities Issued or Assumed—Unpledged.	\$5,218,446.55	Appropriated Surplus Not Specifically Invested.	1,000,000.00
Total Unadjusted Debits.	\$ 372,603.24	Total Appropriated Surplus.	\$ 7,642,197.94
		Profit and Loss Balance.	1,962,574.18
		Total Corporate Surplus.	\$ 9,604,772.12
Grand Total.	\$127,128,598.60	Grand Total.	\$127,128,598.60